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ESTIMATES AND PROJECTIONS of the Labor Force and Civilian Employment in the U.S.S.R.: 1950-1975

by

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I. Introduction

A. PURPOSE AND SCOPE

This report examines the determinants of labor supply in the Soviet Union since 1950 and presents estimates and projections of both the labor force and civilian employment during the years 1950-75. It is primarily quantitative and concerned almost exclusively with aggregates; such factors as labor conditions, wage levels, and skills and attitudes of the labor force are discussed only as they affect the total. No attempt has been made to project labor demand in terms of economic variables, such as national income, except insofar as Soviet plan goals have been used.

This chapter includes a brief summary of the report and a section on the concepts and definitions of the various Soviet manpower measures used here. Chapter II analyzes the important determinants of manpower supply and its utilization. Each factor is discussed in view of its effect on the manpower situation in the period 1950-65, and its possible effect in the future. Chapter III discusses the methods used in deriving the detailed data on the labor force, annual average employment, and man-year and man-hour inputs for the years 1950-75, and concludes with a brief comparison of the results. The appendix tables present the detailed data and include the explicit sources and methods used in making the estimates and projections.

B. SUMMARY

The five most widely used measures of Soviet manpower and its utilization are man-hours, man-days, man-year equivalents, annual average employment, and labor force. Man-hour employment is the least ambiguous measure of labor input, but unfortunately few man-hour data are collected and even fewer are published. Man-day employment is the next best measure of labor input and some data are collected and published. Man-days worked in the private sector can be estimated and converted to man-year equivalents, which roughly approximate the number of persons occupied in the activity on a year-round basis and which are used in combination with reported annual average employment data. Annual average employment represents the average number of persons employed during a year, but it is computed differently for workers and employees[1] and for collective farmers. It is the only series that is reported regularly in the statistical yearbooks and the one often used by Soviet economists to calculate labor productivity. The labor force, which is based on a "gainful worker" concept, is the best measure of the total number of persons engaged in economic activity during the year.

A number of demographic, economic, and educational variables influence the supply of labor. In the years for which projections are presented here (1966-75), most of these variables will operate to A) increase labor force participation. 1) As the sex structure corrects itself from the imbalance resulting from World War II and a larger proportion of the working-age population is composed of men, a higher level of participation in any given age group may be expected. Another demographic factor, 2) decreasing family size, has become and will remain an important element in determining female participation, for the numbers and ages of children at home are important factors in the considerations of a housewife as to whether or not she should enter the labor force. In connection with this, the B) Government's development of child-care institutions and the increased availability of part-time work should facilitate the choice by more women to work outside the household. 2) Planned increases in the number of jobs available in the light industry and service sectors also will be favorable to higher levels of female participation. Increases in money wages are another form of stimulant to participation in the labor force and the increases currently c) planned should have this effect. Increased educational attainment of the population should also be an influence for increased participation. Finally, labor should be used more fully and effectively as the economy becomes more sophisticated and seasonality declines.

There are at least three factors, however, whose influence will be to lower the level of participation in the labor force. 1) The age structure was severely distorted by the effects of World War II and as a result an increasing portion of persons 14 years of age and over will be in the older age groups where participation is lower. This distortion of the age structure is particularly true of women. 3) The effects of this will be heightened by a continuation of rural to urban migration, for labor force participation is much lower for women—and particularly older women—in the cities. Finally, increased enrollment in full-time education will exclude more students from the labor force.

The statistical data presented in this report can be summarized for three periods, 1950-59, 1960-65, and 1966-75. During the first period, both the level of participation by the population in the labor force and the level of utilization of persons working were falling. That is, successively smaller propor-

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[1] This is a major socioeconomic group comprising persons employed primarily in the state sector (including state farms). It embraces all classes of workers, i.e., wageworkers, salaried employees, engineering-technical personnel, minor service personnel, guards, and apprentices.

ons of each age group were participating in conomic activity and those working were contributing less labor per person. The period 1960-65 was ne of high labor demand, with a high rate of ncrease in annual average employment but a low ate of increase in the population of able-bodied ges.[2] Since there is no evidence that the ntensiveness of utilization of persons working hanged significantly during this period, labor rce participation rates must have risen substantially. The fulfillment of the 5-year plan uring the years 1966-70 will require the maintenance of high levels of labor force participation. lthough eased somewhat during the 1970's, the upply of labor will still be limited by the relavely slow rate of growth projected for the able-odied population.

According to the projections, the labor force ill grow at a rate of 1.7 to 1.8 percent per year etween 1965 and 1975, whereas annual average mployment will grow at a rate of 2.0 to 2.1 ercent per year. Thus, annual average employment ariant A) as a proportion of the labor force ariant I) is expected to rise from 89.9 percent 1965 to 94.1 percent in 1975, and the absolute ifference to decline from 12.1 million to 8.4 illion during these 10 years—due largely to a ecrease in seasonality and a shift in employment om agriculture to other sectors.

The labor force should consist of relatively ore men and become somewhat older during the ears ahead. Persons outside the able-bodied ges are projected to increase from an estimated 2.7 percent of the labor force in 1965 to 13.4 ercent in 1975. This change is due to the projected increase in the overaged labor force, for e underaged will change little—from an estimated 1 percent of the labor force in 1965 to 0.9 percent 1975. Within the able-bodied ages, the proportion the labor force 40 years of age and over is ojected to increase from 31.7 percent in 1965 to .7 percent in 1975. The proportion of men in the bor force is projected to increase from 49.2 ercent in 1965 to 51.1 percent in 1975.

The projections of annual average employment sector show no unusual changes. Agriculture is pected to continue to decline as a proportion of tal annual average employment, from 53.7 percent 1950 to 37.2 percent in 1965 and 27.7 percent in 75. Industry's share will remain relatively nstant—25.1 percent in 1965 and 25.5 percent in 75. The three major "productive" sectors—dustry, construction, and agriculture—as a whole rm a declining portion of total employment, from .6 percent in 1950 to 67.5 percent in 1965 and .4 percent in 1975. On the other hand, the public health and education sectors should continue to represent an increasing proportion, from 6.7 percent in 1950 to 10.2 percent in 1965 and 12.9 percent in 1975.

C. CONCEPTS AND DEFINITIONS

Soviet manpower is discussed in this report primarily in terms of labor force, annual average, man-hour, and man-day employment, and man-year equivalent employment. Several other measures are used, but they are only incidental to the main discussion.

The labor force consists of those persons who claim to have an occupation. This is the labor force concept used in the 1939 and 1959 Soviet censuses. It is different from the U.S. concept in that it does not measure both employment and unemployment at a particular point in time; instead, it measures only the number of persons who claim to have an occupation. No allowance is made for recording unemployment as defined in U.S. statistics. Unemployment was "abolished" in the U.S.S.R. in 1930, and since that time no unemployment data have been collected. If a person did not claim to have an occupation he was considered to be out of the labor force whether he was seeking work or not. If a person worked at more than one job he was recorded as belonging to what he considered as his primary occupation. The census is the only source of labor force data for the country as a whole.

The 1959 census schedule contained four questions on employment and occupation:[3]

12. Place of work (name of the enterprise, collective farm, institution) or working in one's own household *(khozyaystvo)*.

13. Occupation at the above place of work (duties or work done).

14. If a person is without an occupation from which income may be derived, show other sources of the person's means of subsistence.

15. Social group to which person belongs.

Each individual was recorded as being in the labor force if his answers to questions 12 and 13 were positive, and as not being in the labor force if his answers to the questions were "none." The instructions to the census were so worded that questions 12 and 13 were to be answered if the respondent replied that he had an occupation. Thus, a person might have been out of work for several months at the time of the census, but still be counted as in the labor force.

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[2] In Soviet terminology the "able-bodied ages" include ales 16 to 59 years old and females 16 to 54 years old.

[3] U.S. Bureau of the Census, Materials, 1959, pp. 31-38.

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All the labor force series in this report utilize the Soviet gainful worker concept.[4] A complication arises, however, from the fact that only the published results of the 1959 census are available as a basis for estimating and projecting the labor force in other years. Although a previous census was taken in 1939 the results were not published in as much detail as for the 1959 census, and the drastic manpower losses due to the war make it impossible to construct valid trends between the two censuses. Because of the lack of labor force data, the estimates and projections of the labor force were made on the basis of assumptions regarding how labor force participation rates (hereafter abbreviated as LFPR's) did and will change, or regarding some given relationship between labor force and regularly published employment statistics (annual average employment). Both procedures are somewhat arbitrary, but under the circumstances they are the most satisfactory.

Changes in the size of the labor force do not necessarily correspond to changes in labor inputs. For instance, if the collective farm population is aging, more people may be working a shorter workday and still be recorded in the labor force, although the total time worked may be falling. Or, if the length of the workday is changed, labor input will change for a constant labor force. Therefore, labor force figures have significant inadequacies for productivity analysis.

Annual average employment data for the Soviet economy are reported regularly in statistical yearbooks, but the figures are heterogenous in definition and coverage. All annual average employment figures for workers and employees (in both agricultural and nonagricultural enterprises) represent annual average registered numbers of persons *(srednyaya spisochnaya chislennost' rabotnikov).* They are derived as the averages of 12 monthly averages which are, in turn, the average of the daily number of persons on the rolls. A person appears on the rolls of an enterprise if he is on that enterprise's payroll and he remains on the rolls during excused absences from work, holidays, etc. In general, this measure is computed the same way in the different sectors for workers and employees, although there are some differences in the method used to compute the monthly average.[5]

The annual average employment series for collective farmers is computed differently from that for workers and employees. The collective farm annual average is the average of the 12 monthly total participation figures. The monthly participation figure is, in turn, the number of different persons participating in socialized production on the farm in a given month. It follows from this that a person counts as one-twelfth of an annual average person if he works in socialized production on the collective farm during a month, regardless of the number of days. This method of computation overstates collective farm employment as compared with employment of other sectors.

Annual average measures are abstractions that do not accurately reflect changes in the number of persons working or in the amount of time they work. If the number of holidays is increased, the annual average number will remain the same, but the number of man-days per person will fall. Also, a change in the length of the workday is not reflected in the annual average. And however poor a measure the annual average is for workers and employees, it is much less satisfactory for collective farmers. Both Western and Soviet economists agree that the collective farm annual average figures leave much to be desired. The fact that a person who works 1 day in a month is counted the same as one who works 30 days clearly demonstrates the inadequacies of this measure. Although annual averages more accurately reflect labor inputs than do labor force figures, they are more ambiguous and heterogeneous than man-day and man-hour figures.

Man-hour, man-day, and man-year equivalent employment figures are the best measures of labor input, but their usefulness varies. A man-hour is easily defined as one person working 1 hour, and it is the least ambiguous measure of labor input. It is, however, the most difficult measure to obtain. A scheduled man-hour per day figure for adults is reported only for industry,[6] although the scheduled average hours worked per week are reported for industry and for all workers and employees (see table A-10). The actual hours worked per day may vary considerably from this scheduled amount because of overtime, part-time work, and the shortened workday for underaged workers. At present, man-hours are not reported by agricultural organizations except on some experimental farms. Thus, there are many problems involved in deriving man-hour data, but it is the only series that is consistent through time even when the length of the workday is changing.

Man-day employment data are more ambiguous than man-hour employment data but they are more easily obtained. The primary inadequacy of the

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[4] In current discussions of the forthcoming 1970 census, mention has been made of possible questions on the seasonality of employment, that is, on the number of months worked during the year by each respondent. Pod''yachikh, "On the Forthcoming," 1966, pp. 38-47.

[5] Two alternative methods of calculating the monthly average number of registered personnel are given in Feshbach, Soviet, 1960, pp. 50, 54. See also Yeremina and Marshalova, Statistika, 1965, pp. 30-36.

[6] The Soviet concept of "industry" includes manufacturing, mining, logging, fishing, current repair of plant and installation, current and capital repair of equipment, and electric power generation.

day figures is that they do not reflect changes ifferences in the length of the working day. nagricultural activities a person contributes n-day regardless of how long he works during lay; overtime or part-time employment is not cted in the man-day statistics. On collective s, part-time work, at least, is reflected in the -day statistics, for a person working only half y will be credited with only one-half a man-7 The nationwide changes in the length of the day for workers and employees between 1956 1960 and planned changes during the present ar plan make the man-day series inconsistent ugh time as a measure of labor input.

The method used to derive the man-day series n in this report was based partially on the umption that the number of man-days worked annual average worker[8] in industry was the ne for other nonagricultural branches. The nber of man-days worked in socialized agricul-e was reported for some years and was estimated other years on the basis of the relationship ween reported figures on annual average employ-nt and man-days worked.

Both Soviet and Western economists estimate ployment in the private subsidiary economy[9] terms of man-days and man-year equivalents.[10] e method generally used is to apply reported timates of input coefficients to reported data on ivate sector activity (i.e., hectares of land ltivated and head of livestock tended). This ethod was used in this report.[11] The man-year uivalent figures were derived from the total timated numbers of man-days worked and the nversion factor of 280 man-days per man-year uivalent, which is often used by Western and viet analysts. This conversion factor, however, not entirely consistent with data reported for her sectors, for during the early 1960's man-days orked per annual average worker in industry nounted to approximately 265, on state farms—35, and on collective farms—240.

To illustrate the differences between the numer-us measures of employment, those pertaining to the socialized economy of collective farms during 1958/59 are as follows:[12]

Total participants (1958)	36,800,000
Labor force (census of January 1959).	32,279,727
Participants (July 1958).	31,916,000
Annual average employment (1958) . .	25,075,000
Participants (January 1959)	18,003,700

The 1959 census shows a labor force for the collective farms of 32,279,727 individuals,[13] although the annual average employment during 1958 was 25,075,000,[14] a difference of about 7.2 million. That is, 32.3 million people claimed that working in the socialized sector of collective farms was their primary occupation during 1958, but the average number actually working was only 25.1 million. And even though 32.3 million people claimed to be collective farmers by occupation, 36.8 million different collective farm members participated in farm work during the year.[15] Of these 36.8 million, only 18.0 million[16] participated in farm work in January 1959, the month of the census, although in the peak month of the preceding year, July 1958, 31.9 million participated.[17]

The difference between the figures for total participants and the labor force represents those farm members who worked on the farm at some time during the year but did not consider this as their primary occupation. The number includes members who were full-time students and who worked only in the summer, members who were usually factory workers but assisted with the harvest, and participating members who considered work in the private subsidiary economy or the household as their primary occupation. The difference between the labor force and annual average figures is primarily due to seasonality. Employment in the peak-level month was 177 percent of that in the lowest-level month and almost 14 million people who worked on collective farms in the summer did not work there in the winter.

One can draw the following conclusions concerning Soviet manpower statistics. The labor force figure is not conceptually comparable with the U.S. figure and is not a valid measure of labor input. The labor force numbers exceed the annual average numbers by substantial amounts and the two series represent quite different concepts. The labor force can be said to represent not only the steadily employed but also persons who move in and out of the labor force on the basis of particular

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[7] Boyarskiy, Statisticheskiy, 1965, p. 686.

[8] Includes wageworkers *(rabochiye)* only, and not employees *(sluzhashchiye)* or other categories of personnel.

[9] This term *(lichnoye podsobnoye khozyaystvo)* refers o agricultural activities of workers and employees and collective farmers (and their families), confined o small private plots.

[10] Man-year equivalents for the private subsidiary economy are regularly published in Soviet sources, but they are for persons working only in the private sector and do not include the labor input of persons working also in the socialized sector.

[11] Nimitz uses the same general method but employs different input coefficients through time and derives substantially higher man-day totals than are presented here. Nimitz, Farm, 1965, p. 7 ff.

[12] For a detailed discussion of these measures, see DePauw, Measures (forthcoming).

[13] Itogi, p. 96.

[14] See table A-11.

[15] See table A-11.

[16] Sel', khoz., 1960, pp. 460-461.

[17] Ibid.

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job opportunities. It would be a mistake, however, to subtract annual average employment from the labor force and call the difference unemployment as defined in the United States. This difference does not necessarily represent those who are looking for work but unable to find it; many are probably quite accustomed to working during certain seasons and do not look for work in other seasons. Presumably, if year-round employment were offered with attractive remuneration, most of the people denoted as being in the labor force would work a full year. This presumption is supported by the fact that the difference between the annual average number and the labor force total has decreased substantially during the years 1926-59, as the economy has become more complex and has offered more workers an alternative to seasonal employment. Whatever else the difference between the labor force and the annual average number represents, it can serve as an index of labor utilization.

The annual average number is the only regularly reported, comprehensive manpower statistic. It is a better measure for the calculation of labor productivity than the labor force number and, since it is reported annually, is the only one that does not require substantial estimation. The man-hour and man-day labor input figures are the most suitable for productivity measurement. Man-hours are the least ambiguous and generally mean the same thing in the different sectors of the economy. The availability of both types of figures is limited, however, and derivation of these series requires extensive estimation. Man-day data are reported more frequently than man-hour data and when necessary they can be derived on the basis of fewer assumptions.

II. The Determinants of Manpower Supply, 1950 to 1975

The analysis of all the factors that affect the supply and utilization of labor is a broad subject indeed, and one that cannot be covered in its entirety here. However, the most important factors determining the level of labor force participation, the level of employment, and the efficiency of the use of manpower will be discussed briefly.[18] The influence of each factor is assessed independently of the influence of other factors. For example, the inference is made that more low-cost child-care institutions will encourage increased labor force participation of women but the conclusion should not be drawn from this alone that female LFPR's will increase, for there are other factors acting in the opposite direction.

A. POPULATION

The peculiarities of the structure and rates of growth of the Soviet population have had important effects on the labor force. For example, the high mortality during World War I, the Civil War, the collectivization of agriculture, and World War II has had a heavy impact on the present size and structure of the Soviet population and consequently has given the Soviet labor force some peculiar characteristics. The very high mortality among men has resulted in the employment of women to an almost unprecedented extent, and the high mortality of certain age cohorts has given the labor force an unusual age structure.

Brackett and DePauw, in summarizing the growth of the Soviet population during the years 1950-75, divide the period into three parts: 1950-59, a period of sustained population growth; the early 1960's, a period of declining growth rates; and 1965-75, a period in which growth rates are likely to fall even more.[19] During the 1950's, the rates of growth varied only from a low of 1.6 percent per year to a high of 1.8 percent. In the early 1960's the growth rate declined to 1.1 percent, and if fertility continues to decline it may drop to 0.5 percent per year in the mid-1970's. The decline in fertility after 1961 will not directly affect the labor force during the years covered in this report since all those who will enter the labor force in the projection years (1966-75) were born before 1962. Thus, only changes in the age and sex structure which were initiated prior to that time will be of concern here in determining the size and structure of the labor force.

1. Age-Sex Structure

Table 1 shows the changes in the distribution of the population 14 years of age and over during the years 1950-75. The proportion of the population 60 years of age and over increases steadily, and more rapidly for females than for males. Since a relatively smaller proportion of persons in this older age group participate in productive activity, other things being equal, the proportion of the population 14 years of age and over which is in the labor force has decreased and will continue to do so.

Table 1.--Percent Distribution of the Population Aged 14 Years and Over, by Age and Sex: January 1, 1950 to 1975

Age	1950	1955	1960	1965	1970	1975
TOTAL						
14 and 15 years.	5.6	5.6	3.4	5.3	5.3	5.1
16 to 19 years..	11.3	12.1	7.3	8.5	9.9	9.9
20 to 29 years..	26.0	25.7	26.0	21.1	17.4	20.7
30 to 39 years..	17.6	16.6	21.8	22.3	21.6	17.5
40 to 49 years..	16.6	16.2	14.5	14.2	17.8	18.2
50 to 54 years..	6.2	6.5	7.3	7.0	5.4	6.6
55 to 59 years..	4.9	5.3	6.0	6.4	6.1	4.7
60 years and over..........	11.8	12.0	13.8	15.2	16.5	17.2
MALE						
14 and 15 years.	6.7	6.7	4.0	6.1	6.0	5.8
16 to 19 years..	13.5	14.1	8.5	9.9	11.3	11.1
20 to 29 years..	28.1	29.2	30.1	24.0	19.7	23.1
30 to 39 years..	16.5	15.7	22.5	24.3	23.8	19.0
40 to 49 years..	15.3	14.8	12.9	12.9	17.5	18.9
50 to 54 years..	5.5	5.5	6.5	6.0	4.5	5.8
55 to 59 years..	4.5	4.4	4.8	5.5	5.0	3.8
60 years and over..........	9.9	9.7	10.7	11.2	12.1	12.5
FEMALE						
14 and 15 years.	4.8	4.9	2.9	4.6	4.6	4.6
16 to 19 years..	9.7	10.6	6.3	7.5	8.8	8.9
20 to 29 years..	24.5	23.2	23.0	18.9	15.6	18.8
30 to 39 years..	18.4	17.3	21.2	20.7	19.8	16.2
40 to 49 years..	17.6	17.1	15.7	15.3	18.1	17.7
50 to 54 years..	6.8	7.4	7.8	7.7	6.1	7.2
55 to 59 years..	5.2	5.9	6.9	7.1	7.0	5.5
60 years and over..........	13.1	13.7	16.1	18.2	19.9	21.2

Source: Computed from Brackett and DePauw, "Population," 1966, pp. 662-674. Figures for 1970 and 1975 were based on the assumptions that mortality will decline in accordance with postwar international experience, and that there will be no international migration.

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[18] For a more detailed discussion of the Soviet population and labor force, see Brackett and DePauw, "Population," 1966; Feshbach, "Manpower," 1966; and Brown, "Soviet," 1966.

[19] Brackett and DePauw, "Population," 1966, pp. 606-610.

The effects of low birth rates during and immediately after World War II are demonstrated in the table by the age groups 14 and 15 years and 16 to 19 years. In 1960, the proportion of both males and females in these age groups (births during the years 1941-46) is unusually small as compared with that 5 years earlier. By 1965 this deficit is felt in the age groups 16 to 19 and 20 to 29, in 1970 it affects primarily the 20 to 29 age group, and in 1975 the 30 to 39 age group. Thus, throughout the 1960's and 1970's the low birth rates of the war will cause an unusually low proportion of the population to be in the prime working ages of 20 to 40 years where labor force participation rates are the highest.

The effect of the changing internal distribution of the population 14 years of age and over may be illustrated by comparing the results of two projections of the labor force—one based on the assumption that the overall proportion of the population 14 years of age and over which is in the labor force will remain constant after 1959, the other based on the assumption that the 1959 LFPR's for specific age and sex groups will remain constant. These projections yield figures of 142.9 million and 137.7 million, respectively, in 1975. The difference of 5.2 million is due solely to the changing distribution of the population among the different age and sex groups.

The effect that a changing population structure can have on the level of employment is further indicated by the following sets of data. The rates of growth of the population of able-bodied ages during various periods of the years 1950-75 are:[20]

Years	Annual growth rate (percent)
1950-58	1.9
1959-65	0.5
1966-70	1.5
1971-75	1.8

During the same period, annual average employment is estimated to increase as follows: [21]

Years	Annual growth rate (percent)
1950-58	2.0
1959-65	2.1
1966-70	2.0
1971-75	2.2

Clearly, something drastic happened in the period 1959-65. The rate of growth of annual average employment was much higher than that of the population of able-bodied ages. This was possible only if more people were brought into the labor force from outside the able-bodied ages, if labor force participation rates of those in the prime working ages increased, or if people worked more steadily—thereby decreasing the difference between annual average employment and the labor force. Probably all three factors were operative, but it is difficult to see how a fairly substantial increase in LFPR's could have been avoided. The labor supply must have been extremely taut during the period. It is clear from the data, too, that a continued high level of labor force participation will be required to fullfill the present 5-year plan (1966-70) for labor.

Females account for a little less than half of the annual average number of workers and employees and for more than half of the able-bodied collective farmers working in socialized agriculture. In comparison with other countries these are unusually high proportions and are due to a conscientious effort on the part of the Soviet Government to attract women into the labor force—a policy initiated at the beginning of the industrialization drive and made more necessary by the loss of males during World War II. This is not to say that Soviet leaders would not have wanted more women in the labor force if the sex ratio were normal, but that the imbalance of the sex ratio became so great as to make female labor essential. The sex balance is gradually being corrected, but the population will not become normal in this respect until 2020.[22] The increasing proportion of males in the population, with their higher level of participation in the labor force, means that a larger labor force can be expected from a given age, or age group, in the future. Soviet leaders apparently plan to continue an explicit policy of drawing more women into the labor force, but this will be difficult because of the aging female population.

2. Family Size

The size of a woman's family and her labor force status are strongly interrelated. As the family size becomes larger, the disutility of leaving the household for outside employment increases, and vice versa. From another point of view, as better paying and more pleasant jobs become available, the disutility of having children becomes greater. The relationship between these factors is complex and it is difficult to determine any one line of causation. (That is, do increased levels of female labor force participation cause decreases in fertility, or do decreases in fertility allow more

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[20] Calculated from ibid., pp. 663-669. Figures for January 1 reported in this source were adjusted to July 1 by linear interpolation to make them more comparable to annual averages.

[21] Calculated from data in table A-7.

[22] Brackett and DePauw, "Population," 1966, p. 612. In 1966, there were 84.9 males per 100 females, and only by 2020 will this ratio be 100.1 to 100.

women to enter the labor force?) Even so, it is clear that the level of labor force participation and family size are inversely related. Scattered data from the Soviet Union support this conclusion.[23] Thus, female participation would be expected to increase, *ceteris paribus*, as fertility declines. The means of controlling family size through contraceptives and abortion are generally available to urban women and apparently are being used. Rural women have less possibility for controlling family size. Nevertheless, overall marital fertility has been declining steadily since 1950.[24]

The Soviet Government can rely on three methods of inducing women with children to work—higher wages, free or low-cost child care, and part-time work. It has tried all three, but places the greatest emphasis on providing child-care facilities for working mothers. According to the current 5-year plan, the number of children in preschool state institutions is to increase by 60 percent—to a total enrollment of 12.2 million—during the years 1966-70.[25] If this effort is successful, an increase in labor participation of women can be expected.

Sonin has noted that party leaders are actively considering offering more part-time work opportunities.

> . . . .at the 22nd Congress it was pointed out that in the letters of workers there is the suggestion that for women with many children a shortened work day be established and that they receive pay accordingly. The Central Committee considers it necessary to direct our Government and trade union organs to consider this question and prepare their own proposals.[26]

This concern by the party in 1961 was followed by sample surveys investigating the question of introducing a shortened workweek for mothers but, outside of an authorization for textile plants to hire part-time labor,[27] little has actually been done. Presumably the effect of more part-time work would be to draw more women into the economy as well as to reduce the time worked by some of those already working. Sonin estimates that there are approximately 1.4 million women working full-time in the national economy (except agriculture and some nonproductive branches) who would like to work only a half day.[28] The planners must face the question, therefore, of whether more part-time work for women would actually increase the total labor supply. They may try to be selective in their policy—that is to encourage full-time work in areas where female employment is already high and to encourage part-time work in areas where female employment is low. Since the female labor supply is fairly immobile, this policy may prove to be successful.

In summary, as the disutility of entering the labor force decreases (more part-time work opportunities, smaller families, and more child-care facilities) and wages offered increase, more housewives should become part of the labor force, other things equal. This does not necessarily mean, however, that there will be a commensurate increase in the total labor input (man-days or man-hours).

3. Geographical Distribution

There are many paradoxes in the geographical distribution of labor in the Soviet Union. This is true of the distribution between different regions of the country, as well as between urban and rural areas. The rural population is very large for an industrialized country, yet there is concern about the rate of rural-to-urban migration. The eastern regions of the country are in need of labor resources, although the proportion of people in these regions not occupied in the socialized economy is relatively high. These problems of matching labor use to labor resources are so troublesome that at least one Soviet economist thinks that the establishment of territorial and regional balances of labor is the most important contemporary problem of labor resource planning.[29]

Soviet leaders are making an effort to industrialize the eastern regions of the country and to enlarge the population there. The Government has allocated a relatively large amount of capital to the area,[30] much of which is invested in heavy industry. Labor, however, cannot be so easily allocated. In the relatively free labor market that now exists in the Soviet Union, workers must be attracted by wages,

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[23] M. Ya. Sonin, Aktual'nyye, 1965, p. 204. Sonin shows data derived from sample surveys in Novosibirsk Oblast and Krasnoyarsk Kray which illustrate the opportunity costs of leaving the household and private sectors for employment in the socialized sector. The savings and income derived from household and private sector work increase as the family size increases. A. N. Gladyshev, "Reserves," 1962, p. 17, demonstrates that the proportion of women wanting to work part time or not at all increases as the family size increases. These data are probably from the same source as Sonin's. The fact that family size is inversely related to labor force participation is also supported in G. A. Slesarev, Metodologiya, 1965, p. 110. Here, data are given for Gorkiy City and Oblast showing that the number of births per woman employed in the socialized sector were fewer than for women not so occupied—1.3 and 1.9, respectively.

[24] As derived from maternal and paternal gross reproduction rates given in Brackett and DePauw, "Population," 1966, p. 649.

[25] Uchitel'skaya gazeta, March 1, 1966.

[26] Sonin, Aktual'nyye, 1965, p. 143.

[27] Feshbach, "Manpower," 1966, p. 757.

[28] Sonin, Aktual'nyye, 1965, p. 153.

[29] Ibid., p. 279.

[30] Two times the national per capita average during the 7-year plan period (1959-1965). Ibid., p. 125.

fringe benefits, and other incentives. Money wages are higher in the eastern regions and many workers have migrated for this reason, but a large number stay for only a short time. They leave because of the low level of social and cultural services, the lack of adequate housing, the lower real wages due to higher prices, and the severe climate. As a consequence, out-migration from these areas has been higher recently than in-migration. In addition, the transitory aspect of the labor supply makes it very difficult to establish a well-trained and efficient labor force. Some Soviet economists suggest that the problem is due in large part to lack of planning, for industry is distributed with no plan for how labor might be attracted and retained.

The shortage of labor in the eastern regions is not general, but one of certain types of labor. Skilled labor is in short supply and many factories are forced to hire more than the normal number of workers because the needed skills are not available:

> The lack of qualified workers is one of the reasons for maintenance at enterprises of above-norm numbers of workers, which in many cases permits fulfillment of the plan of output due solely to the number of workers. Thus, for machine-building factories of the Novosibirsk Sovnarkhoz, the number of workers was 4.4 percent above plan.[31]

There is also an acute shortage of agricultural workers. Budget survey data show that the collective farmers of Western Siberia work more and longer days than their counterparts in the western regions of the U.S.S.R.[32]

Another problem in the eastern regions (as well as elsewhere) is the less than full utilization of labor. Many Soviet economists look upon the household and private sectors as reserves of labor that can and should be attracted into the socialized sector. They see that in the small cities with a low level of industrialization a relatively low proportion of the able-bodied population is engaged in socialized production and they reason that industry should be placed in such areas to utilize the labor used only in household work and in the private sector.[33]

Soviet planners are also faced with other problems in utilizing labor efficiently in the eastern regions. Labor turnover in these regions is comparatively high, as is shown in table 2, with a resultant loss of worktime that would be reflected in both annual average employment and labor input data. There are also above-normal losses of worktime in the east due to sickness. A survey of the Scientific-Research Institute of Labor showed that the proportion of workers absent from work due to sickness was three times higher for enterprises in Siberia than in the Ukraine and southern parts of the country.[34]

Table 2.--Labor Turnover Rates in the R.S.F.S.R., by Region: 1963

Region	Turnover rate[1]	Index numbers (Center = 1.0)	
		Turnover rate	With adjustments for different branch structure
R.S.F.S.R....	18.1	1.4	
Center..........	13.0	1.0	1.0
Western Siberia..	22.3	1.7	1.8
Eastern Siberia..	30.3	2.3	2.0

[1] Number of persons who quit their employment voluntarily or were fired for infractions of labor discipline per 100 annual average wageworkers employed.

Source: Kalinovskiy, Rayonnyye, 1966, p. 85.

Both the difficulty of attracting and keeping workers and the "incomplete" utilization of labor resources are probably reflected in lower labor force participation rates, lower annual average employment, and fewer man-hours or man-days worked per worker in the eastern regions. However, the higher level of agricultural labor utilization counteracts these effects to some extent. If more attractive employment opportunities were available in the eastern regions, presumably more people would be economically active and those who were active would be more likely to remain on the job.

In contrast to the eastern regions, many western regions have a surplus of labor. Out-migration exceeds in-migration in the north and the east, but the opposite is true of the Ukraine and the southern areas of the R.S.F.S.R., especially in the North Caucasus region. These latter regions have long been labor surplus areas and the continuing in-migration is only adding to existing surpluses, causing poorer utilization of the able-bodied population.

> In 1959-62, for example, one-fifth of the R.S.F.S.R.'s population growth was accounted for by the Northern Caucasus, although this region contains only one-tenth of the republic's total population. This largely explains why at present about one-fifth of the able-bodied population of the Northern Caucasus is employed on private plots and does not participate in socialized production.[35]

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[31] Perevedentsev, Sovremennaya, 1965, p. 18.

[32] Ibid., p. 19.

[33] Prudenskiy, Vremya, 1964, p. 137; Pokshishevskiy, "Geography," 1962, p. 10; Feshbach, "Manpower," 1966, p. 722.

[34] Prudenskiy, Vremya, 1964, p. 102.

[35] Manevich, "Universality," 1965, p. 26.

It is evident that the geographical distribution and migration of labor is sometimes in direct conflict with the allocation of capital. If this situation continues it could have a significant effect on the level of employment in the socialized sector.

Some Soviet economists recognize the problems involved in what they consider to be regional "imbalances" in the distribution of labor. Recommendations have been made for solving them by raising real wages and improving living conditions in the east. If these steps are successful, the utilization of labor according to all indices should increase. The problem is not new, however, and steps taken to solve it in the past years have been largely ineffective. On the whole, there appears to be little reason to think that the situation in the eastern regions will change significantly, if at all, and therefore the regional "maldistribution" of the population will probably continue to affect the manpower situation much as it has in the past.

The rate and composition of rural-to-urban migration is also a very important factor in the Soviet manpower situation. Generally, labor force participation rates in the urban areas are different from those in the rural areas. For instance, there are fewer opportunities for the elderly and the unskilled in the cities and these groups have a lower level of participation than in rural areas. This is particularly true for women.

Table 3 contains labor force participation rates by urban and rural residence calculated directly and partly estimated from 1959 census data. The difference between urban and rural residence does not affect overall male participation greatly, but there is a significant difference in female participation, both overall and by age group. It follows from the lower urban female rates that these rates must increase substantially if the rates for all females are to be maintained in the face of continued migration into urban areas. According to our estimates, the 1959 urban female LFPR's would have had to increase by about 11 percent to attain the numbers of females in the labor force in 1965 shown in variant I. On the basis of the assumption that the rural population will decline during the 1966-75 period at the same rate as between 1959 and 1965, the urban female LFPR's would have to increase by another 6 to 8 percent by 1975 just to maintain the 1965 levels of female participation.

Table 3.--Labor Force Participation Rates, by Age, Sex, and Urban-Rural Residence: 1959

(In percent)

Age	Male		Female	
	Urban	Rural	Urban	Rural
10 to 19 years	25.8	37.0	26.9	38.5
20 to 29 years	90.7	91.3	76.4	84.8
30 to 39 years	97.3	92.1	70.7	85.5
40 to 49 years	90.2	96.2	55.2	95.7
50 to 54 years	80.2	99.8	39.7	93.5
55 to 59 years	69.5	95.7	17.6	72.5
60 years and over	24.0	69.7	10.1	49.8
All ages	56.0	55.6	41.2	56.6

Source: The rates for "all ages" were derived by dividing the total labor force (given by sex and urban and rural residence in Itogi, p. 97) by the appropriate population total (given in ibid., p.51). The LFPR's by age group were estimated as follows. The agricultural portion of the rural labor force was derived, by age and sex, by using the age-sex distribution of the agricultural labor force given in ibid., pp. 119, 121. The nonagricultural portion of the rural labor force was derived, by age and sex, on the basis of the assumption that the distribution was the same as for the total labor force given in ibid., p. 117. The sum of these calculations was then divided by the appropriate rural population. The urban labor force, by age and sex, was derived by subtracting the rural labor force from the total. Urban participation rates were then computed. All of the computed rates include persons working only in the private subsidiary sector.

The influence of increasing urbanization will be toward lowering the level of participation, particularly of females. Accompanying this, however, will be a tendency to utilize labor more efficiently, as seasonality is much less severe in most types of urban employment. Thus, in terms of manpower statistics, increasing urbanization should cause annual average employment to approach the labor force total more closely.

B. ECONOMIC FACTORS

1. Wages and Employment

Labor in the Soviet Union is allocated by a comparatively free market. With certain exceptions, labor is free to move about and seek its highest reward, but the determination of the reward itself is largely out of its control. Norms of pay are decided upon by the planners, and the worker has little control over his wages. Individual

plants may offer a worker more pay by upgrading his job category and making him eligible for higher wages, but this is the only form of competitive money-wage bidding for labor.[36] In addition there is considerable nonmonetary competition for labor; housing, for instance, is used to attract workers.

Soviet economists accept implicitly, if not explicitly, that the level of employment is a function of wages. Discussions about the tradeoff between work in the household and private sector, on the one hand, and employment is the socialized sector, on the other, imply that the wage in the latter is a very important factor. Differential wages are also mentioned as a method of attracting workers to the eastern regions as well as the reason for movement between sectors of the economy or branches of industry. Both real and money wages have been rising since before 1950 and according to the 1966-70 plan they are to rise even faster in the future. Therefore, if the quantity of labor supplied is an increasing function of the level of wages (all other factors constant), the quantity of labor supplied can be expected to increase.[37]

There is another argument along these lines that suggests increased participation by the population, particularly by the groups more marginal to the labor force. With a greater availability of consumer goods, the real wage corresponding to any level of money wages would be higher. Or stated differently, the additional wage earned by a women is more valuable to her if there are goods available which she wants. In the Soviet Union, plans have been made for increases in the quantity and quality of consumer goods, and as these plans are carried out they should encourage labor force participation.

2. Sectoral Composition

Changes in the sectoral composition of the economy can affect employment opportunities for all persons and especially for women, the overaged, and the unskilled. As more attractive and less strenuous jobs become available, these latter groups are more likely to become active in the labor force. For this reason the relative expansion of services and light industry in the Soviet Union should result in a higher rate of participation, especially for women and the overaged.[38] On the other hand, a shift away from agriculture may cause some of the unskilled, particularly women, to drop out of the labor force. Therefore, expected sectoral shifts should affect labor participation in opposite directions. Probably the shift to the service sectors and light industry will be the more important factor, and sectoral shifts generally should bring increased labor participation among groups marginal to the labor force.[39]

C. SCHOOL ENROLLMENT AND ATTAINMENT

Several aspects of the educational system in the Soviet Union affect the level of labor force participation. 1) The level of full-time school enrollment directly affects the labor force participation rates in certain age groups. 2) In addition, the level of educational attainment indirectly affects the degree of labor force participation, for as the attainment of the population increases, the opportunity costs of remaining out of the labor force probably increase and the level of labor force participation increases.

Soviet planners take account of the impact of full-time enrollment on the level of labor force participation and they have changed their educational system several times during the past decade to facilitate the short-run labor supply.[40] Table 4 illustrates the problems of this type faced during the recent 7-year plan period (1959-65). The size of the age group 16 to 19 years declined rapidly, and as full-time enrollment increased the number of persons in this age group available for the labor force decreased even more rapidly. This resulted in a decrease in the LFPR's for this group by an estimated 28 percent between 1959 and 1963. Our projections of LFPR's for this group, which are based primarily on projections of full-time school enrollment, indicate that LFPR's will remain around 50 percent in the period 1966-75. Full-time enrollment in college is so small relative to the size of the age group concerned (20 to 29) that its effect on LFPR's is insignificant.

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[36] Under the reforms initiated in October 1965 there will be an additional source of wage competition as more successful enterprises are able to offer greater premiums to their personnel.

[37] During the 1930's the supply of labor increased as money wages rose and real wages fell. If the real wages were the determining factor and the inverse relationship between real wages and the labor supply still holds, increased real wages after 1950 should have decreased the supply of labor, *ceteris paribus*. This is not descriptive of what happened during the late 1950's and early 1960's, however, when increasing real wages were accompanied by an increased labor supply.

[38] Annual average employment in trade, education, and public health is expected to increase by approximately 30 percent each during the current 5-year plan, while industrial employment is expected to increase by only 12 percent. See Sonin, "Problems," 1966, p. 33.

[39] This tendency should be reinforced by the pension law of 1964 which allows older workers to receive their pensions while working.

[40] For more information on this subject, see DeWitt, "High-Level," 1966, especially pp. 792-795, and Rosen, "Changing," 1966, pp. 823-827.

Table 4.–Estimates and Projections of Labor Force Participation Rates for the Population Aged 16-19 Years: 1959 to 1975

(Figures are in thousands, except for LFPR's which are percentages)

Year	Population 16 to 19 years (1)	Full-time enrollment[1] (2)	Population not full-time students (col. 1-col. 2) (3)	Not in labor force or enrolled in school (col. 3 x .1601)[2] (4)	Labor force (col. 3-col. 4) (5)	LFPR[3] (6)
1959.............	13,338	2,829	10,509	1,682	8,827	66.2
1960.............	11,003	2,717	8,286	1,362	6,961	63.3
1961.............	9,396	3,208	6,188	991	5,199	55.4
1962.............	9,153	3,675	5,478	877	4,601	50.3
1963.............	10,356	4,501	5,855	937	4,917	47.5
1964.............	12,196	5,101	7,095	1,135	5,956	48.8
1965.............	14,032	5,923	8,109	1,298	6,811	48.5
1970.............	17,870	6,364	11,506	1,842	9,664	54.1
1975.............	19,332	7,808	11,524	1,845	9,679	50.1

[1] Composed of day students in the 10th and 11th grades, specialized secondary, and vocational-technical schools. Enrollment in the 10th grade was projected for years after 1965 as a constant proportion of the 16 to 19 population. It was assumed that there were no 11th grade enrollments after 1965. For years after 1964 specialized secondary and vocational-technical school enrollment figures were taken from Central Intelligence Agency, School, 1966. It was assumed that 80 percent of vocational-technical school enrollment consisted of full-time students.

[2] The inactive group was assumed to be a constant proportion of the population not full-time students. The proportion used was derived from the 1959 census results (= 1,682/10,509).

[3] For 1959 the rates were computed directly from the census results and amounted to 65.9 percent for males and 66.5 percent for females. Because of the very close correspondence of these rates, those for other years were assumed to apply to both males and females.

Source:

Column 1: Brackett and DePauw, "Population," 1966, pp. 662-674.

Column 2: Nar. khoz. v 1962, pp. 551, 562; Nar. khoz. v 1963, pp. 555, 556, 558; Nar. khoz. v 1964, pp. 667, 668, 669, 678; Nar. khoz. v 1965, pp. 678, 679, 688; Central Intelligence Agency, School, 1966, pp. 15, 17.

Bowen and Finegan have investigated the relationship of educational attainment and labor force participation in the United States in 1960 by analyzing data from the U.S. Bureau of the Census' one-in-a-thousand sample.[41] The results show a significant relationship between increases in educational attainment and labor force participation for the different groups studied: Males 25 to 54, males 65 to 74, and married women 18 to 64 with husband present and no children under 6. The relationship is most clearly defined for the latter two groups, which are more marginal to the labor force. The authors expected the strong relationship for the following reasons:

> (1) There are good reasons to think that educational attainment is positively related to intelligence, to ambition, and probably to physical and mental health as well and that these characteristics are in turn related to labor force participation.
>
> (2) . . . education increases a person's expected market earnings and thus increases the differential return between market and nonmarket activity; that is, the opportunity cost of staying out of the labor market is greater for a person with considerable education than for a person with relatively little education.
>
> (3) Educational attainment also increases access to the cleaner, more pleasant, more interesting jobs.
>
> (4) Finally, it seems plausible that educational attainment affects the taste for work itself. Here we venture into unfamiliar terrain, but our brand of amateur psychology and sociology suggests that more education may well lead people to want the social contacts and social interchange that employment often affords.[42]

The dissimilarities between the U.S. and the Soviet labor force are surely not so great as to prevent a qualified application of this statistical

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[41] Bowen and Finegan, "Educational," 1966, pp. 567-582.

[42] Ibid., p. 568.

study to the Soviet labor force.[43] If educational attainment is a prime determinant of labor force participation, particularly of marginal groups in the United States, it seems reasonable that the same would be true of the Soviet Union, where increased educational attainment does increase the wage earned and does allow for entrance to cleaner, more pleasant, and more interesting jobs.

The median level of educational attainment of the Soviet population has been rising and it is predicted that the level will continue to rise even faster. The U.S. Bureau of the Census has projected an increase in the median number of years of school completed by the population 10 years of age and older from 5.7 in 1959 to 7.1 in 1975.[44] If one accepts the hypothesis that increased attainment will lead to higher levels of labor force participation, labor force participation should increase, all other factors remaining constant.

D. UTILIZATION

The discussion above has been largely concerned with the level of participation by the population in the labor force. This section is concerned with the actual utilization of the persons in the labor force, that is, the amount of labor input in man-hours or man-days per worker.

The intensity of utilization of nonagricultural labor has generally declined since 1950. For example, the average wageworker in the productive sphere worked 2,475 hours per year in 1950, but only 2,128 in 1962.[45] This decline was due to the drop in both the number of hours worked per day and the number of days worked per year. In industry, the number of man-days worked per annual average wageworker dropped from 276.3 in 1950 to 263.4 in 1962. This is explained largely by the fact that between these dates the average vacation increased from 14.9 days to 17.0 days per year, the number of holidays and days off increased from 55.5 to 61.0, and absences for sickness and for official reasons also increased.[46] Similar changes occurred in the other nonagricultural sectors. The number of scheduled hours per workday for adults in industry and the other sectors also dropped from 8.00 in 1950 to 6.93 in 1962, because of the reduction in the length of the workday between 1956 and 1960. During the 1960's both the number of hours per day and days per year worked by industrial workers were stabilized (see table A-10). Recently Brezhnev announced that enterprises would be permitted to change to a 5-day workweek but with the qualification that the length of the workweek remain at 41 hours.[47] In view of this statement and the relative stability of labor input per worker in the 1960's, one can expect that the actual labor input per working person will be relatively stable in the future.

Soviet economists frequently express dissatisfaction with the rate of labor turnover and cite it as being economically harmful. At least at the national level, their concern does not seem to be warranted, for selected data do not indicate a trend of increased labor turnover and the rates are not unusually high by Western standards.[48] Furthermore, to the extent that labor turnover represents the movement of workers to more productive employment, there is a gain to the economy. Thus, labor turnover decreases the level of utilization in terms of labor derived per participant but it may increase productivity in the long run.

The efficient utilization of the agricultural labor force in the U.S.S.R. poses seemingly contradictory problems. According to Soviet economists, quite significant amounts of labor are lost due to poor utilization of the regular work force, particularly on collective farms. At the same time, the farms hire a large amount of outside labor during their months of peak activity. According to the data of Gosplan *(Gosudarstvennyy planovoy komitet* — the State Planning Committee), 86 percent of the available labor resources were utilized on state farms during the period 1958-60, but only 68 percent on collective farms. Also, according to Gosplan, 3.3 billion available man-days were not utilized by collective and state farms in socialized production during the 3-year period 1956-58.[49] Even with this pool of unutilized manpower, the farms rely heavily on workers from outside. During

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[43] The Bowen and Finegan study is a cross-section analysis and is not necessarily applicable in projections where the general level of attainment is increasing for all. That is, their findings may be due to relative differences in educational attainment, not the absolute level. They have also investigated the relationship of educational attainment and labor force participation hrough time. Higher educational attainment does appear o increase the level of participation for married women with husband present, but results for other groups were ot statistically significant, with the exception of older males in 1940. See Bowen and Finegan, "Labor," 965, pp. 127, 131, and 137.

[44] Goodman and Feshbach, Educational (forthcoming).

[45] Rozhneva, "Features," 1965, pp. 112-115; Zanin, abocheye, 1963, p. 110.

[46] Table A-10 and Nar. khoz. v 1962, p. 131.

[47] Komsomol'skaya pravda, March 30, 1966, p. 6.

[48] Feshbach, "Manpower," 1966, p. 732.

[49] Although the derivation of these figures is not given in the source, presumably the percentage of utilization is the average number of days worked per able-bodied member as a percentage of the maximum possible work-time *(maksimal'no vozmozhnyy fond rabochego vremeni)*, which is probably calculated as 290 days per year for agriculture. The figure giving the absolute loss is, accordingly, the total possible working time (290 times the numbers of farmers) minus the total time actually worked by all farmers. Karnaukhova, "Productivity," 1964, p. 48.

September 1961 hired and attached workers amounted to 7.8 percent of the total number of persons working on collective farms in the R.S.F.S.R. and 12.5 percent in the Kazakh S.S.R. In November 1961 this figure was 22.5 percent for the Uzbek S.S.R.[50] According to Karnaukhova:

> On state farms in 1940 there were on the average 42 seasonal and temporary wage-workers per 100 permanent workers and in July-August—68. In 1962 these figures changed respectively to 18 and 28.[51]

The main source of this problem is the seasonality of agriculture, which is particularly pronounced in the Soviet Union. During the period from 1950 to 1963, January employment on collective farms varied within the range of 56 to 59 percent of July employment (table A-11). And, in reference to state farms, Glukhov writes:

> It is true that seasonal fluctuation among permanent workers of the state farms is insignificant. In August 1961, their number was only 10 percent higher than in December. However, the proportion is quite different among seasonal and temporary workers. The fluctuation of these categories is quite wide in different periods of agricultural work. If one takes into consideration the fact that in 1961 the number of seasonal and temporary workers on state farms of the country was over 1 million persons [annual average employment was 7.3 million], it becomes apparent how important it is to utilize them more rationally.[52]

Because of seasonality, there are well over 10 million idle workers in socialized agriculture during the winter, yet agriculture still experiences a severe labor shortage during the harvest season.

It is expected that seasonality will decline in the future and therefore that annual average employment will more closely approach the labor force. In agriculture, the continuous introduction of technology and the expected expansion of employment on state farms, where labor is used more efficiently, should lead to a decline in seasonality. Also, there will be less seasonality in the economy as a whole as a larger proportion of the labor force is engaged in nonagricultural occupations.

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[50] Shmelev, Raspredeleniye, 1965, p. 94.

[51] Karnaukhova, "Utilization," 1964, p. 55.

[52] Glukhov, "Utilization," 1963, p. 26.

III. Estimates and Projections of Labor Force and Employment

A. METHODS AND ASSUMPTIONS

Data on the population, labor force, annual average employment, and man-hour employment for the period 1950-75, and on man-day employment for the period 1950-65 are given in table 5. These series and alternative variants for labor force, annual average employment, and man-hour employment are given in the appendix tables in further detail.

Table 5.—Estimates and Projections of Population, Labor Force, and Civilian Employment: 1950 to 1975

(Labor force figures are the variant I series; annual average employment and man-hour figures are the variant A series. Population and labor force figures are as of July 1)

Item	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
POPULATION (thousands)												
Total population aged 14 years and over	129,708	139,578	145,192	147,049	147,944	148,663	149,711	151,234	153,272	155,747	158,506	161,424
Male	53,633	58,636	61,526	62,499	62,996	63,403	63,983	64,825	65,928	67,241	68,713	70,279
Female	76,075	80,942	83,666	84,550	84,948	85,260	85,728	86,409	87,344	88,506	89,793	91,145
LABOR FORCE (thousands)												
Total	97,005	99,995	105,211	106,924	106,920	108,961	109,181	108,621	109,804	111,731	113,623	115,676
Armed forces	4,600	6,100	5,800	4,600	3,900	3,800	3,600	3,300	3,000	3,000	3,000	3,000
Civilian labor force	92,405	93,895	99,411	102,324	103,020	105,161	105,581	105,321	106,804	108,731	110,623	112,676
Nonagricultural sectors	42,474	46,750	49,539	51,158	53,071	55,226	57,587	60,425	63,539	65,597	67,703	70,222
Agricultural sectors	49,931	47,145	49,872	51,166	49,949	49,935	47,994	44,896	43,265	43,134	42,920	42,454
Of which, private sector	9,824	8,969	10,104	10,824	10,296	10,416	9,497	7,960	7,681	8,100	8,520	8,100
CIVILIAN EMPLOYMENT												
Total (annual average, thousands)	79,894	81,724	87,218	89,942	91,119	93,421	93,912	95,228	97,834	99,597	100,793	103,364
Nonagricultural sectors	36,958	41,234	44,023	45,642	47,555	49,710	52,071	54,909	58,023	60,103	62,187	64,706
Agricultural sectors	42,936	40,490	43,195	44,300	43,564	43,711	41,841	40,319	39,811	39,494	38,606	38,658
Of which, private sector	11,899	10,864	12,238	12,505	12,471	12,616	11,503	10,896	11,273	11,297	10,867	10,906
Total (man-day, millions)	21,793	21,793	23,485	23,861	23,854	24,367	24,692	25,141	25,698	26,147	26,539	27,382
Nonagricultural sectors	10,212	11,333	12,031	12,420	12,716	13,323	13,877	14,655	15,329	15,832	16,448	17,244
Agricultural sectors	11,581	10,460	11,454	11,441	11,138	11,044	10,815	10,486	10,369	10,315	10,091	10,138
Of which, private sector	3,332	3,042	3,427	3,501	3,492	3,532	3,221	3,051	3,156	3,163	3,043	3,054
Total (man-hour, millions)	174,344	174,344	187,880	185,175	184,220	185,477	186,018	180,171	181,460	184,224	186,438	191,959
Nonagricultural sectors	81,696	90,664	96,248	93,647	95,116	97,125	99,498	96,283	100,712	104,016	108,063	113,293
Agricultural sectors	92,648	83,680	91,632	91,528	89,104	88,352	86,520	83,888	80,748	80,208	78,375	78,666
Of which, private sector	26,656	24,336	27,416	28,008	27,936	28,256	25,768	24,408	25,248	25,304	24,344	24,432

Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
POPULATION (thousands)											
Total population aged 14 years and over	164,441	167,459	170,394	173,420	176,586	179,706	182,868	186,117	189,398	192,708	195,947
Male	71,900	73,532	75,130	76,781	78,508	80,220	81,964	83,762	85,587	87,437	89,258
Female	92,541	93,927	95,264	96,639	98,078	99,486	100,904	102,355	103,811	105,271	106,689
LABOR FORCE (thousands)											
Total	119,906	121,411	123,152	125,114	127,220	129,422	131,741	134,099	136,455	138,898	141,418
Armed forces	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Civilian labor force	116,906	118,411	120,152	122,114	124,220	126,422	128,741	131,099	133,455	135,898	138,418
Nonagricultural sectors	73,386	75,352	77,550	79,971	82,535	85,196	87,973	90,790	93,603	96,505	99,484
Agricultural sectors	43,520	43,059	42,602	42,143	41,685	41,226	40,768	40,309	39,852	39,393	38,934
Of which, private sector	8,939	8,865	8,794	8,722	8,650	8,578	8,506	8,434	8,363	8,291	8,219
CIVILIAN EMPLOYMENT											
Total (annual average, thousands)	107,852	109,990	112,169	114,435	116,794	119,211	121,764	124,417	127,178	130,047	133,029
Nonagricultural sectors	67,751	70,211	72,711	75,300	77,981	80,721	83,595	86,571	89,653	92,845	96,150
Agricultural sectors	40,101	39,779	39,458	39,135	38,813	38,490	38,169	37,846	37,525	37,202	36,879
Of which, private sector	12,034	11,938	11,842	11,745	11,648	11,551	11,455	11,358	11,262	11,165	11,068
Total (man-day, millions)	28,611	(No projections made)									
Nonagricultural sectors	18,055										
Agricultural sectors	10,556										
Of which, private sector	3,370										
Total (man-hour, millions)	200,457	204,140	207,887	211,784	215,846	220,006	224,407	228,983	233,747	238,702	243,852
Nonagricultural sectors	118,621	122,939	127,317	131,850	136,545	141,342	146,375	151,586	156,982	162,572	168,359
Agricultural sectors	81,836	81,201	80,570	79,934	79,301	78,664	78,032	77,397	76,765	76,130	75,493
Of which, private sector	26,960	26,741	26,526	26,309	26,092	25,874	25,659	25,442	25,227	25,010	24,792

Source:
Population: Brackett and DePauw, "Population," 1966, pp. 662-674.
Labor force: Table A-1.
Employment: Annual average: Table A-7; Man-day: Table A-8; Man-hour: Table A-9.

1. Labor Force

The standard method of making labor force projections is to multiply participation rates for age-sex groups by projected population figures for comparable age-sex groups. The participation rates may be held constant or they may be projected as changing through time. The precision of this method is limited, however, by the amount of data available. If the population and labor force data are published in sufficient detail, LFPR's can be computed for small age groups; and, if the data are collected and published by yearly or monthly intervals, trends can be derived for the LFPR's.

These conditions are only partially fulfilled in the data available on the Soviet Union. The 1959 census results were published in sufficient detail that a fairly reliable distribution can be made of the labor force by age and sex for that year. However, one troublesome problem is that persons working only in the private sector are not reported in the same detail, by age, as persons working in socialized production. Therefore, the distribution of the private sector personnel must be partially estimated. Also, the published data permit LFPR's to be derived for only 10-year age groups within the range 20 to 49 years, although it would be preferable to have 5-year, or even 1-year, age groupings.

Another problem is that the only source for labor force participation rates is the 1959 census, for there are no data from other censuses or periodic surveys that allow one to derive LFPR's for other years. The 1926 census is too far removed in time to be of use, and there are subtle differences of definitions which make comparisons with later censuses difficult. The meager published results of the 1939 census do not permit calculation of detailed LFPR's by age and sex for that date. Thus, for all practical purposes there are no data on the trends of labor force participation rates by small age and sex groups. Therefore, for projections of the labor force we have LFPR's for eight age groups, by sex, for 1959; population projections by detailed age and sex groups; and scattered, aggregate data from past censuses or other sources.

The 1959 LFPR's for the U.S.S.R. were relatively low for males in the prime working ages but were unusually high for females at all ages. This can be seen by comparing these rates with the average rates for selected countries (table A-3). The female rates were so high that there is no effective basis for comparison; therefore estimates of probable changes in these rates are necessarily arbitrary. The female LFPR's may have approached a maximum consistent with then current levels of fertility, or there may have existed possibilities for further increases in female participation. We simply have no basis for comparison except the U.S.S.R. itself in 1926 and 1939, but even then we cannot compare small age and sex groups. The participation of males in the prime working ages does not differ greatly from one country to another. It is also less liable to confusion because of differences in statistical procedures or definitions, i.e., prime-age males are usually occupied in work that is counted as labor participation in most countries, whereas women in agricultural households are counted differently from one country to another.

The excess of the rate of increase of annual average employment over the rate of increase of the able-bodied population between 1959 and 1965 indicates that even with a substantial increase in male LFPR's the female rates also must have risen significantly. In our labor force variant I (the preferred alternative) it was deemed necessary to increase the male rates by approximately 5 percent and the female rates by approximately 7 percent between 1959 and 1965. This means that the female rates, already high in 1959, were even higher in 1965. To illustrate the effect of the high female rates, LFPR's for the United States in 1965 were applied to the Soviet population in 1965 and a labor force figure calculated. The results are compared with the variant I labor force for 1965, below.

	Total	Male	Female
Using U.S.S.R. rates (variant I, in thousands)[53]..	119,906	58,718	61,188
Percent of those 14 years and older in labor force.........	72.9	81.7	66.1
Using U.S. rates[53] (in thousands)..............	91,029	56,795	34,234
Percent of those 14 years and older in labor force.........	55.4	79.0	37.0

Since the same population was used in each calculation, all differences are due to differences in LFPR's. The results show that the level of male participation was similar for the U.S. and U.S.S.R., but that the level of female participation was drastically different (U.S. LFPR's averaged 56 percent of the U.S.S.R. LFPR's). Since the female rates so far exceed the rates in the United States and other countries, one might reasonably expect them not to increase further. However, if within the context of the socioeconomic situation in the Soviet Union 66 percent of women 14 years of age and over participated in the labor force in 1965, it is difficult to say why the level could not rise to 70 or 75 percent or higher—even though such increases are difficult to accept on the basis of experiences in other countries.

Projections were made by assuming that the 1959 LFPR's will remain constant or by increasing

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[53] See tables A-2 and A-3.

them arbitrarily. In the absence of labor force data for any period after 1959, various methods were used to estimate how LFPR's might have changed after the base year. First, the 1959 LFPR's were adjusted on the basis of the annual average employment data which are reported yearly. Second, the 1959 LFPR's were adjusted selectively using a combination of the average rates for selected countries in table A-3 and the rates for selected Eastern European countries. Where the U.S.S.R. rates were lower than the averages, they were adjusted to equal the averages, and in come cases even to exceed the averages; others were adjusted on the basis of Eastern European experience. Third, the 1959 LFPR's were adjusted arbitrarily by assuming given rates of increase in the 1959 rates. The first method was utilized in variant I (described below) and the third method was used to build alternative models (variants II and III described below). The second method was discarded for two reasons: (1) Conceptually, the selective adjustments do not constitute a consistent, explainable whole; and (2) because of the different structure of the U.S.S.R. rates and because of conceptual differences in manpower statistics from one country to another, the applicability of LFPR's of other countries to the U.S.S.R. is of questionable value.[54]

Four variants of the total labor force were prepared, plus two variants of the agricultural labor force (table A-1 and A-2). The population data used in preparing the total labor force series are from Brackett and DePauw.[55] The projections of the population were based on the assumptions that mortality will decline and that there will be no migration.

For the period 1950-65 variant I was derived on the basis of the relationship between annual average employment and the labor force in 1959 and reported annual average employment in other years. Estimates of the labor force for each of the component sectors (nonagricultural employment, agricultural workers and employees, collective farmers, and persons employed only in the private sector), as given in table A-1, were derived separately and summed to obtain estimates of the total labor force. For those sectors with increasing employment (nonagricultural employment and agricultural workers and employees), the difference between the labor force and annual average employment was held constant at an amount equal to the absolute difference between the two at the time of the census in January 1959. For those sectors with decreasing employment (collective farmers and the private sector), the ratio of the January 1959 labor force to annual average employment was held constant. Such a method of estimation allows the annual average total to approach the labor force total slowly.

For the period 1966-75 the total labor force was projected on the basis of estimated LFPR's for 1965 and the assumption that these remain constant through 1975 (table A-3). The 1965 LFPR's were derived by increasing the 1959 rates in an amount necessary to yield the 1965 labor force, which was estimated independently. The 1959 rates were increased proportionately except that account was taken of full-time educational enrollment, no LFPR for an age-sex group was allowed to exceed 98 percent, and female rates were allowed to increase slightly more than male rates.

The components of variant I were projected as follows. The Armed Forces were assumed to remain constant throughout the period at 3 million. The three agricultural sectors were projected by using the same methods as for the years 1950-65. The two variants of the agricultural labor force for the years 1966-75 (variants I and I-A, table A-1) were based on two variants of annual average employment projected for these years. The nonagricultural labor force in both variants I and I-A was derived as the difference between the total labor force and the agricultural labor force.

Variants II and III are presented as alternative models to show how the labor force changes under varying assumptions. Variant II is designed to demonstrate the general magnitude of LFPR changes that would be necessary if variant I results are to be exceeded by an appreciable amount. The LFPR's for all of the age groups over 19, for both sexes, were increased by 7 percent in the period 1959-65. The female LFPR's derived for 1965 were then increased by an additional 1 percent in 1970 and another 1 percent in 1975; the male LFPR's derived for 1965 were held constant to 1975. No rates were allowed to exceed 98 percent and the rates for 1960 were obtained by linear interpolation between the rates for 1959 and 1965. The increase of 7 percent between 1959 and 1965 was equal to the increase for female LFPR's in variant I, but exceeded the 5 percent increase for male LFPR's in variant I. By 1975, both male and female LFPR's in variant II exceed their counterparts in variant I by 2 percent. LFPR's for ages 16 to 19 were permitted to increase after 1965, in accordance with the trend in school enrollment (table 4) and not held constant at the 1965 level as in variant I. Variant III is designed to show the size of the labor force if male LFPR's are increased after 1959 as in variant II, but female LFPR's are held constant at the 1959 level. No estimates were made for variants II and III for the years before 1959.

Variant IV is presented as a control series and is based on the assumption that the 1959 LFPR's

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[54] Two series were derived by this method. The results of one were very close to the variant IV presented here, and the results of the other were close to variant I.

[55] Brackett and DePauw, "Population," 1966, pp. 662-674.

ll have remained constant for the 1950-75 riod. Thus, differences in the size of the labor rce according to this variant and the sizes cording to the other three variants at any point in ne are due to changes in LFPR's. This variant es not provide a realistic series for various asons. As mentioned above, the male LFPR's in 59 were unusually low and they probably have creased. If the reason for the low rates at the me of the census was disablement due to war, the tuation should improve in the future with the aging the labor force of the severely affected cohorts. econdly, reported school enrollment data imply decrease in the participation rates for the age roup 16 to 19 years after 1959 (see table 4). ariants I, II, and III were adjusted to reflect this nange, but variant IV was not. And finally, the tal labor force in 1975 implied by variant IV is ery low if the annual average employment proections are correct.

2. Annual Average Employment

The annual average employment series preented in this report are composed of reported and rojected annual average employment figures for he state and collective sectors plus estimated man-ear equivalents for the private sector. The annual verage lends itself well to projection, for the urrent 5-year plan gives a plan figure for the nnual average number of workers and employees n 1970. In addition, the plan has output and proluctivity goals for industry and agriculture which an be used to calculate changes in annual average mployment within the respective sectors during he plan period.

Two variants of annual average employment fter 1965 are presented here (table A-7). The lifference between the two is in the projection of employment in agriculture. Variant B was rojected according to planned (1966-70 plan) inreases in output and productivity which imply drop in annual average agricultural employment of 1.4 percent per year. These plan figures for griculture imply a basic change in the agricultural situation which is difficult to foresee, however. The planned increase in productivity is 7 percent er year, although the increase experienced during he period 1958-64 was only 3.9 percent per year.[56] The planned increase in output is 5.5 percent per year, but the increase actually attained during the ast plan period was only 1.9 percent per year.[57] Furthermore, the rate of decrease planned for annual average socialized agricultural employment of 1.4 percent per year exceeds the 0.8 percent which occurred in the years 1961-65 (table A-5). Given these relationships, it seemed essential to prepare an alternative projection of annual average agricultural employment based on the trend established during the period 1955-64. Thus variant A also projects annual average agricultural employment as dropping fairly rapidly, but not so drastically as in variant B.[58]

Both variants were projected to 1975 by using the average annual rates of change derived for the period 1966-70. In both variants it was assumed that annual average state farm employment will increase by 300,000 per year, or at roughly the level during recent years.

According to the 1966-70 plan, the annual average number of workers and employees will be between 91 and 92 million (assumed to be 91.5 million in our calculations) in 1970. Annual average nonagricultural employment was derived from this figure by subtracting the estimated annual average employment on state farms. Within the nonagricultural sector, employment in industry was projected on the basis of planned increases in output and productivity for the years 1966-70. Employment in the other nonagricultural branches was projected by assuming that changes in the distribution of employment among them would continue as in the 1950-65 period. Soviet planners expect the relative share of employment in the nonproductive sectors to rise much faster than in the past, but this is not specifically accounted for in projections which use past trends. Projections made on the above basis do, however, yield this result: The nonproductive sphere grows faster than the productive sphere. The rate of increase projected for total nonagricultural employment during the 1966-70 period was also used for the 1970-75 period. The methodology used to distribute the various elements in the earlier years was also used for the years after 1970.

3. Man-Day and Man-Year Equivalent Employment

Man-day employment data are reported only for some years in certain sectors and estimates were made to fill in missing figures for the years 1950-65. Nimitz' figures were used for man-day inputs to the socialized sector of agriculture,[59] and figures previously estimated by the Foreign Demographic

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[56] Calculated from data in Nar. khoz. v 1964, p. 73, and Nar. khoz. v 1959, p. 89.

[57] Calculated from data in Tsifrakh v 1965, p. 70.

[58] Sonin calculates a 4 percent drop in agricultural employment during the 5-year plan period (Sonin, "Some Problems," 1966, p. 32). Sonin states that his projection was based on planned increases in output and productivity. The variant B projection of agricultural employment was also made on the basis of the 1966-70 plan increases in output and productivity, but the projected decrease of 6.8 percent is much larger than Sonin's. It is not known precisely what methods and data Sonin used. Variant A, however, projects a 4 percent decrease in agricultural employment during the plan period (1966-70). This result is identical to Sonin's, but is derived differently.

[59] Nimitz, Farm, 1965, p. 7.

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Analysis Division were used for the private sector.[60] The man-day employment figures for the nonagricultural sector were derived on the basis of data for industrial wageworkers alone. (See table A-8 for the man-day series.)

Projections were not made for man-day employment because the length of the workweek is currently changing. Many enterprises are in the process of converting to the 5-day workweek and during the next 5-year plan period many more will do so. Since the timing of the conversion is not scheduled, there is no valid way of estimating how the change will affect man-day employment measures in any year.

The man-year equivalent employment series for the private sector, which is included with the annual average employment series, was calculated for the 1950-65 period as the quotient of the total number of man-days worked during a year in this sector divided by 280 man-days per man-year equivalent. This conversion factor has been used previously by the Foreign Demographic Analysis Division and by Nimitz, as well as by some Soviet economists (especially Gol'tsov). The two projected man-year equivalent series (variants A and B) were based on the assumption that the 1965 ratio of this measure to employment in socialized agriculture will remain constant.

4. Man-Hour Employment

Estimates of man-hour employment during the period 1950-65 were derived by multiplying man-day employment figures by estimates of the number of hours worked per day in the various sectors (table A-9). Hours per man-day in the nonagricultural sectors were estimated from data on the scheduled length of the workday for industrial wageworkers and the length of the workweek for all workers and employees. For the years before 1956, it was assumed that the scheduled length of the workday applied to all six workdays; that is, there were no shortened workdays before days-off and holidays. Hours per man-day in agriculture were derived by assuming that the 8-hour day applied to collective farmers in all years and to state farmers through 1960, after which state farmers were assumed to have worked a 7-hour day. Very limited data suggest that the assumptions for agriculture are reasonably accurate, but the constancy over time is surely an oversimplification.[61] Projections of man-hour employment for the years 1966-75 were based on the assumption that the number of man-hours worked per annual average employed person in each sector in 1965 will remain constant throughout the projection period.

As is evident from the above, the derivation of man-hour employment data requires extensive estimation and rests on several assumptions which must be considered as highly tenuous. Even considering the possible errors in the estimation procedure, however, this series is preferable to those of man-day employment or annual average employment when the most consistent measure of labor input is sought.

B. COMPARISON OF THE SERIES

The results of the alternative estimates and projections of the labor force and annual average employment for the period 1950 to 1975 are summarized in table 6. As these data show, the four labor force series differ in terms of the

Table 6.—Alternative Estimates and Projections of the Labor Force and of Annual Average Employment, by Sector: 1950 to 1975
(In thousands)

Variant	1950	1955	1960	1965	1970	1975
LABOR FORCE						
Variant I	97,005	105,211	108,621	119,906	129,422	141,418
II	(X)	(X)	110,870	120,429	131,537	143,657
III	(X)	(X)	110,425	117,949	128,147	139,765
IV	92,664	103,321	110,118	116,292	126,112	137,723
EMPLOYMENT						
Variant A—						
Total	78,807	85,907	94,219	107,852	119,211	133,029
Nonagricultural	36,958	44,023	54,909	67,751	80,721	96,150
Agricultural	41,849	41,884	39,310	40,101	38,490	36,879
Variant B—						
Total	(Same as variant A)				118,091	130,978
Nonagricultural					80,721	96,150
Agricultural					37,370	34,828

X Not estimated.
Source: Tables A-1, A-2, and A-7.

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[60] Feshbach, "Manpower," 1966, pp. 746-747. These estimates include individual peasants.

[61] See Nimitz, Farm, pp. 122-125 and 140. Nimitz gives a figure of 8.4 hours for collective farmers in 1958 which was a favorable year for agriculture. She believes that the workday may have been considerably shorter during unfavorable years. The data for state farms apply to the "standard workday" and these data are used by the Soviets in labor productivity calculations.

projected size of the labor force in 1975, as well as in the path of attainment. They also vary in their relationship to the course of growth in annual average employment. The differences among all the variants can be seen in table 7, where comparative growth rates are presented.

Table 7.--Growth Rates of Selected Manpower Measures: 1950 to 1975

(In percent per year)

Measure	1950-60	1961-65	1966-70	1971-75	1950-65	1966-75
Population aged 14 years and over.	1.6	1.7	1.8	1.7	1.6	1.8
Population of able-bodied ages....	1.6	0.7	1.4	1.8	1.3	1.6
Labor force						
Variant I....................	1.1	2.0	1.5	1.8	1.4	1.7
Variant II...................	(X)	1.7	1.8	1.8	(X)	1.8
Variant III..................	(X)	1.3	1.7	1.8	(X)	1.7
Variant IV...................	1.7	1.1	1.6	1.8	1.5	1.7
Annual average employment						
Variant A....................	1.8	2.5	2.0	2.2	2.0	2.1
Variant B....................	(X)	(X)	1.9	2.1	(X)	2.0
Man-day employment...............	1.4	2.6	(X)	(X)	1.8	(X)
Man-hour employment..............	0.3	2.2	1.9	2.1	0.9	2.0

X Not estimated or projected.

Source: Tables 5, A-1, A-2, A-7, A-8, and A-9.

During the period 1950-60 variant IV exhibits a faster rate of growth than does variant I because it shows a much lower total in 1950 and a somewhat higher total in 1960. If variant I is correct, LFPR's must have fallen between 1950 and 1959, for projecting backward with constant rates (variant IV) gives a lower total labor force for 1950. It is reasonable that LFPR's might have fallen during this period, considering trends over the period 1926-59 (table 8) and the probability that LFPR's in 1950 were still high as a result of World War II.

In the period 1961-65 the labor force series tied to changes in annual average employment (variant I) exhibits the highest rate of growth. Annual average employment was growing much faster than all of the labor force variants, but so much faster than variants II, III, and IV that variant I seems to be the only reasonable alternative for this period.

Differences in the growth rates of the four variants during the periods 1966-70 and 1971-75 are small. Since the same age-sex distribution of the population is used for all variants, the differences that do occur are primarily due to the differences in patterns of LFPR's used in 1965 and the increase in female LFPR's in variant II for 1970 and 1975. The only other LFPR's that change after 1965 are those for the 16 to 19 age group—for both males and females in variant II and for males only in variant III—and these changes are slight. However, the difference between the labor force in this age group in variant IV (constant 1959 LFPR's) and the other variants (LFPR's lowered in accordance with estimated and projected full-time school enrollment) is quite large—approximately 3.2 million for both sexes in 1975. This difference is so large because the difference in the LFPR's is substantial (approximately 15 percentage points) and the number in the age group is very large (19.3 million in 1975).

During the period 1950-65 variant I is based directly on reported annual average employment data. During the two later periods, 1966-70 and 1971-75, its growth rate changes in the same direction as the growth rates of average annual employment (i.e., when the growth rate of annual average employment increases or decreases, so does the growth rate of variant I). Since the projections of annual average employment are based directly on past levels of employment and official Soviet plan data, they are considered the most reliable projections offered here—and the labor force series (variant I) which is most consistent with them is considered the most reasonable.

If variant I is accurate, it implies (1) that LFPR's for both sexes increased sharply in the period 1959-65; and (2) that the very high rates derived for 1965 will have to be maintained through 1975. In the face of continuing rural to urban migration which tends to lower participation rates, the maintenance of this level of participation—and especially the higher level of participation of variant II—will require considerable effort on the part of the Government in the following areas: (1) Pension laws that allow a pensioner to work and receive part of his pension at the same time will have to be continued beyond the present 5-year

Table 8.—Labor Force Participation Rates, by Age and Sex: 1926, 1939, and 1959

(In percent)

Age group	1926	1939	1959
BOTH SEXES			
10 to 15 years...........	58.7	23.4	[1]3.8
16 to 59 years...........	85.0	83.6	83.9
60 years and over........	54.1	49.1	40.1
10 years and over........	77.2	68.9	74.0
Total population.........	57.5	52.8	52.2
MALE			
10 to 15 years...........	61.0	24.2	[1]3.3
16 to 59 years...........	95.7	97.8	88.5
60 years and over........	74.4	72.1	52.5
10 years and over........	86.9	80.7	74.5
Total population.........	63.8	61.1	55.8
FEMALE			
10 to 15 years...........	56.3	22.7	[1]4.3
16 to 59 years...........	75.4	70.6	80.1
60 years and over........	38.2	34.8	33.8
10 years and over........	68.7	58.2	67.0
Total population.........	51.3	45.3	45.8

[1] Assumes that none of the labor force is less than 14 years old. The figure for this age group is not comparable to Eason's (1926 and 1939) for he does not make this assumption.

Source: 1926 and 1939: Eason, "Labor," 1963, p. 54.
1959: Derived from census data in the same manner as indicated in table A-3.

limit which is due to expire in 1968; (2) if more women are to be attracted to the labor force, more child-care facilities and part-time employment opportunities will have to be made available to them; (3) assuming that the supply of labor is an increasing function of wages, higher wages will have to be offered; and (4) employment opportunities will have to be matched to the numbers of employable people in different areas of the country.

The data for annual average employment through 1965 are reported, hence there is no difference between variants A and B. After 1965 the differences between the two are due to different rates of decline for employment in agriculture.[62] According to variant A, annual average agricultural employment will decline by 8.1 percent between 1965 and 1975; according to variant B, agricultural employment will decline by 13.1 percent (see tables 6 and A-7).

Annual average employment has been growing and is expected to continue to grow more rapidly than any of the labor force variants, which means that the difference between the two has been narrowing in the past and will be even narrower in the future. Past trends suggest that this might be expected, for annual average employment as a proportion of the total labor force was 77.9 percent in 1939 and 86.0 percent in 1959.[63] However, if either variant III or variant IV is correct for 1975, a very rapid decrease since 1959 in the difference between annual average employment and the labor force is implied. The difference would narrow so much that it would be more reasonable to expect that the projected annual average employment totals for 1975 will not be attained.

The projections of annual average employment imply two specific policies. First, in the absence of a figure in the 1966-70 plan as to the planned number of workers and employees in agriculture, it was assumed here that this category would increase at the rate of 300,000 per year. This is in line with past trends and implies that the Government will continue its policy of converting collective farms to state farms. Second, the attainment of either variant will require a significant improvement in agricultural labor productivity, which in turn will require heavy capital investment in agriculture, particularly if variant B is to be attained.

Man-day employment and annual average employment are estimated as growing at approximately the same rate in the early 1960's, but in prior years man-day employment grew more slowly. This variation in growth rates during the 1950's can be explained by the lower number of man-days contributed by an annual average worker in 1960 than in 1950 (see table A-10).

Man-hour employment grew very slowly in the 1950's because of the gradual reduction in the length of the workday which took place during the years 1956-60. After 1960 the length of the workday was stabilized and man-hour employment increased significantly, but more slowly than annual average employment. This differential in growth rates follows from the distribution between the agricultural and nonagricultural sectors of reported and projected annual average employment. This is to say that since the number of man-hours worked per annual average employed person on collective farms is higher than the comparable figure for the nonagricultural sectors, a shift from agricultural to nonagricultural employment will result in a lower rate of growth of man-hour employment than if the structure of employment remains unchanged.

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[62] As has been noted, man-year equivalent employment is used for the private sector in the annual average employment variants. Man-year equivalent employment is identical for both variants A and B during the years 1950-65. After 1966 the figures differ, but only inasmuch as they are projected as a function of the two series of annual average employment in agriculture.

[63] Eason, "Labor Force," p. 46, and table 5.

Table A-1.—Estimates and Projections of the Labor Force of the U.S.S.R., by Sector: 1950 to 1975

(In thousands, as of July 1)

Line no.	Item	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
	VARIANT I												
1	Total..................	97,005	99,995	105,211	106,924	106,920	108,961	109,181	108,621	109,804	111,731	113,623	115,676
2	Armed Forces.................	4,600	6,100	5,800	4,600	3,900	3,800	3,600	3,300	3,000	3,000	3,000	3,000
3	Civilian labor force..........	92,405	93,895	99,411	102,324	103,020	105,161	105,581	105,321	106,804	108,731	110,623	112,676
4	Nonagricultural sectors.....	42,474	46,750	49,539	51,158	53,071	55,226	57,587	60,425	63,539	65,597	67,703	70,222
5	Agricultural sectors........	49,931	47,145	49,872	51,166	49,949	49,935	47,994	44,896	43,265	43,134	42,920	42,454
6	Workers and employees.....	4,398	4,758	5,200	5,234	6,189	6,656	6,799	8,084	8,802	9,158	9,300	9,513
7	Collective farmers........	35,709	33,418	34,568	35,608	33,464	32,863	31,698	28,852	26,782	25,876	25,100	24,841
8	Private sector...........	9,824	8,969	10,104	10,324	10,296	10,416	9,497	7,960	7,681	8,100	8,520	8,100

Line no.	Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	VARIANT I											
1	Total..................	119,906	121,411	123,152	125,114	127,220	129,422	131,741	134,099	136,455	138,898	141,418
2	Armed Forces.................	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
3	Civilian labor force..........	116,906	118,411	120,152	122,114	124,220	126,422	128,741	131,099	133,455	135,898	138,418
4	Nonagricultural sectors.....	73,386	75,352	77,550	79,971	82,535	85,196	87,973	90,790	93,603	96,505	99,484
5	Agricultural sectors........	43,520	43,059	42,602	42,143	41,685	41,226	40,768	40,309	39,852	39,393	38,934
6	Workers and employees.....	10,128	10,450	10,773	11,095	11,418	11,740	12,062	12,384	12,707	13,029	13,351
7	Collective farmers........	24,453	23,744	23,035	22,326	21,617	20,908	20,200	19,491	18,782	18,073	17,364
8	Private sector...........	8,939	8,865	8,794	8,722	8,650	8,578	8,506	8,434	8,363	8,291	8,219
	VARIANT I-A											
1	Total..................		121,411	123,152	125,114	127,220	129,422	131,741	134,099	136,455	138,898	141,418
2	Armed Forces.................		3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
3	Civilian labor force..........	(Same as variant I for 1950-65)	118,411	120,152	122,114	124,220	126,422	128,741	131,099	133,455	135,898	138,418
4	Nonagricultural sectors.....		75,621	78,083	80,755	83,564	86,461	89,464	92,498	95,522	98,627	101,798
5	Agricultural sectors........		42,790	42,069	41,359	40,656	39,961	39,277	38,601	37,933	37,271	36,620
6	Workers and employees.....		10,450	10,773	11,095	11,418	11,740	12,062	12,384	12,707	13,029	13,351
7	Collective farmers........		23,528	22,608	21,697	20,791	19,893	19,003	18,120	17,242	16,370	15,507
8	Private sector...........		8,812	8,688	8,567	8,447	8,328	8,212	8,097	7,984	7,872	7,762

Table A-1.—Estimates and Projections of the Labor Force of the U.S.S.R., by Sector: 1950 to 1975--Continued

Table A-1.--Estimates and Projections of the Labor Force of the U.S.S.R., by Sector: 1950 to 1975--Continued

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VARIANT I

Total--line (1)

1950-65: Sum of parts, (1) = (2) + (3).
1966-75: Table A-2.

Armed Forces--line (2)

1950-61: Reported in Central Intelligence Agency, Labor, 1964, p. 17.
1962-75: Assumed to remain constant at the 1961 level.

Civilian labor force--line (3)

1950-65: Sum of parts, (3) = (4) + (5).
1966-75: Total labor force minus Armed Forces, (3) = (1) - (2).

Nonagricultural sectors--line (4)

1950-65: Computed as the sum of annual average employment in the nonagricultural sectors (table A-4) and the difference between the 1959 census labor force (Itogi, pp. 96, and 104-105) and the average of 1958 and 1959 annual average employment in this category. The census figure was adjusted by subtracting the estimated number (117,000) of nonagricultural workers who were presumed to be attached to state agricultural activities. The labor force figure for collective farms used below includes 458,000 collective farmers attached to the farms but who were engaged in nonagricultural work. The number of workers and employees connected with state agricultural activities but doing nonagricultural work was estimated by assuming that the ratio of nonagricultural labor force to the total labor force in state agricultural activities was the same as for collective farms.

1966-75: Civilian labor force minus agricultural labor force, (4) = (3) - (5).

Agricultural sectors--line (5)

1950-75: Sum of parts, (5) = (6) + (7) + (8).

Workers and employees--line (6)

1950-75: Computed as the sum of annual average employment in this category (table A-5) and the difference between the 1959 census labor force and the average of 1958 and 1959 annual average employment of agricultural workers and employees. The census worker and employee labor force in agriculture equals the number of persons doing agricultural work (Itogi, p. 104) plus those doing nonagricultural work (117,000) as estimated for line (4) above.

Collective farmers--line (7)

1950-75: Computed as the product of annual average employment on collective farms (table A-5, variant A) and the ratio of the 1959 census labor force (Itogi, p. 96) to the average of 1958 and 1959 annual average employment in this category. The figures do not include persons working in the private sector only.

Private sector--line (8)

1950-59, 1966-75: Computed as the product of man-year equivalent employment figures for the private sector (table A-6) and the ratio of the 1959 census private sector labor force (Itogi, p. 96) to the average of 1958 and 1959 man-year equivalent employment in the private sector. The census figure includes individual peasants and those occupied only in the private sector.

1960-65: The 1959 figure was moved by an index of yearly employment of persons working only in the private subsidiary sector as derived from Sel'. khoz., p. 450; Nar. khoz. v 1960, p. 521; Nar. khoz. v 1961, p. 461; Nar. khoz. v 1962, p. 368; Nar. khoz. v 1963, p. 363; Nar. khoz. v 1964, p. 419; and Nar. khoz. v 1965, p. 435. These data were not available for years before 1959.

VARIANT I-A

This variant was derived in the same manner as variant I, with the exception that the annual average employment series used to derive the collective farm labor force was variant B of table A-5, rather than variant A.

Table A-2.—Estimates and Projections of the Labor Force of the U.S.S.R., by Age and Sex: 1950 to 1975

(In thousands, as of July 1)

Variant and year	Both sexes				Male				Female			
	Total	14 and 15 years	16 to 54/59 years	55/60 years and over	Total	14 and 15 years	16 to 59 years	60 years and over	Total	14 and 15 years	16 to 54 years	55 years and over
VARIANT I												
1966	121,411	1,344	105,612	14,455	59,725	594	54,517	4,614	61,686	750	51,095	9,841
1967	123,152	1,346	106,857	14,949	60,875	595	55,489	4,791	62,277	751	51,368	10,158
1968	125,114	1,354	108,360	15,400	62,147	599	56,571	4,977	62,967	755	51,789	10,423
1969	127,220	1,398	110,025	15,797	63,490	619	57,702	5,169	63,730	779	52,323	10,628
1970	129,422	1,421	111,853	16,148	64,879	630	58,879	5,370	64,543	791	52,974	10,778
1971	131,741	1,430	113,859	16,452	66,326	635	60,118	5,573	65,415	795	53,741	10,879
1972	134,099	1,457	115,921	16,721	67,787	648	61,377	5,762	66,312	809	54,544	10,959
1973	136,455	1,486	118,003	16,966	69,243	662	62,656	5,925	67,212	824	55,347	11,041
1974	138,898	1,506	120,199	17,193	70,754	672	64,025	6,057	68,144	834	56,174	11,136
1975	141,418	1,512	122,510	17,396	72,323	675	65,487	6,161	69,095	837	57,023	11,235
VARIANT II												
1959	109,346	636	97,834	10,876	52,749	280	48,938	3,531	56,597	356	48,896	7,345
1960	110,870	769	98,756	11,345	53,715	339	49,704	3,672	57,155	430	49,052	7,673
1965	120,429	1,311	105,076	14,042	59,299	580	54,181	4,538	61,130	731	50,895	9,504
1970	131,537	1,421	113,747	16,369	65,964	630	59,857	5,477	65,573	791	53,890	10,892
1975	143,657	1,512	124,386	17,759	73,190	675	66,231	6,284	70,467	837	58,155	11,475
VARIANT III												
1959	109,346	636	97,834	10,876	52,749	280	48,938	3,531	56,597	356	48,896	7,345
1960	110,425	769	98,402	11,254	53,715	339	49,704	3,672	56,710	430	48,698	7,582
1965	117,949	1,311	103,225	13,413	59,299	580	54,181	4,538	58,650	731	49,044	8,875
1970	128,147	1,421	111,184	15,542	65,964	630	59,857	5,477	62,183	791	51,327	10,065
1975	139,765	1,512	121,477	16,776	73,190	675	66,231	6,284	66,575	837	55,246	10,492
VARIANT IV												
1950	92,664	1,098	83,483	8,083	42,445	472	39,176	2,797	50,219	626	44,307	5,286
1951	94,432	1,237	84,908	8,287	43,473	533	40,090	2,850	50,959	704	44,818	5,437
1952	96,411	1,383	86,513	8,515	44,619	597	41,114	2,908	51,792	786	45,399	5,607
1953	98,696	1,420	88,504	8,772	45,939	615	42,350	2,974	52,757	805	46,154	5,798
1954	101,083	1,347	90,675	9,061	47,328	585	43,697	3,046	53,755	762	46,978	6,015
1955	103,321	1,234	92,701	9,386	48,657	538	44,993	3,126	54,664	696	47,708	6,260
1956	105,333	1,051	94,532	9,750	49,907	460	46,226	3,221	55,426	591	48,306	6,529
1957	107,089	784	96,177	10,128	51,059	344	47,393	3,322	56,030	440	48,784	6,806
1958	108,455	614	97,333	10,508	52,027	270	48,331	3,426	56,428	344	49,002	7,082
1959	109,346	636	97,834	10,876	52,749	280	48,938	3,531	56,597	356	48,896	7,345
1960	110,118	769	98,138	11,211	53,408	339	49,440	3,629	56,710	430	48,698	7,582
1961	111,057	927	98,591	11,539	54,139	409	50,002	3,728	56,918	518	48,589	7,811
1962	112,157	1,071	99,206	11,880	54,921	473	50,615	3,833	57,236	598	48,591	8,047
1963	113,334	1,190	99,895	12,249	55,724	526	51,246	3,952	57,610	664	48,649	8,297
1964	114,703	1,266	100,776	12,661	56,624	560	51,976	4,088	58,079	706	48,800	8,573
1965	116,292	1,311	101,870	13,111	57,642	580	52,826	4,236	58,650	731	49,044	8,875
1966	118,019	1,344	103,092	13,583	58,751	594	53,764	4,393	59,268	750	49,328	9,190
1967	119,893	1,346	104,498	14,049	59,960	595	54,803	4,562	59,933	751	49,695	9,487
1968	121,903	1,354	106,076	14,473	61,253	599	55,915	4,739	60,650	755	50,161	9,734
1969	123,970	1,398	107,724	14,848	62,573	619	57,032	4,922	61,397	779	50,692	9,926
1970	126,112	1,421	109,513	15,178	63,929	630	58,186	5,113	62,183	791	51,327	10,065
1971	128,373	1,430	111,477	15,466	65,345	635	59,404	5,306	63,028	795	52,073	10,160
1972	130,646	1,457	113,467	15,722	66,758	648	60,623	5,487	63,888	809	52,844	10,235
1973	132,934	1,486	115,494	15,954	68,171	662	61,867	5,642	64,763	824	53,627	10,312
1974	135,299	1,506	117,626	16,167	69,634	672	63,194	5,768	65,665	834	54,432	10,399
1975	137,723	1,512	119,852	16,359	71,148	675	64,606	5,867	66,575	837	55,246	10,492

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All estimates and projections were prepared by applying labor force participation rates to estimates and projections of the population by age and sex. The population figures are from Brackett and DePauw, "Population," 1966, pp. 662-674. The population projections were based on the assumptions that mortality will decline and that there will be no migration. The series of labor force participation rates used are given in table A-3, and are as follows:

Variant I: 1966-75 - col. (4).
Variant II: 1959 - col. (3); 1960 - interpolations of col. (3) and col. (5); 1965 - col. (5); 1970 - col. (6); 1975 - col. (7).
Variant III: Males - same as variant II; females - same as variant IV.
Variant IV: 1950-75 - col. (3).

Table A-3.—Comparative Labor Force Participation Rates, by Age and Sex: 1959 to 1975

(In percent)

Age and sex	Averages for selected countries	United States, January 1965	U.S.S.R., 1959 census	U.S.S.R., variant I, 1965	U.S.S.R., variant II		
					1965	1970	1975
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MALES							
14 and 15 years.....	41.8	13.7	13.1	13.1	13.1	13.1	13.1
16 to 19 years......	72.7	46.9	65.9	48.5	48.5	54.1	50.1
20 to 29 years......	93.3	90.9	91.0	95.6	97.4	97.4	97.4
30 to 39 years......	96.7	97.7	95.0	98.0	98.0	98.0	98.0
40 to 49 years......	96.5	96.6	93.0	97.6	98.0	98.0	98.0
50 to 54 years......	94.2	94.5	90.1	94.6	96.4	96.4	96.4
55 to 59 years......	90.7	90.3	83.5	87.7	89.3	89.3	89.3
60 years and over...	66.6	43.0	52.5	55.1	56.2	56.2	56.2
FEMALES							
14 and 15 years.....	28.0	9.8	17.1	17.1	17.1	17.1	17.1
16 to 19 years......	53.4	31.4	66.5	48.5	48.5	54.1	50.1
20 to 29 years......	44.7	44.0	80.4	86.1	86.0	86.9	87.8
30 to 39 years......	29.3	39.6	77.7	83.2	83.1	83.9	84.7
40 to 49 years......	28.2	49.3	75.4	80.8	80.7	81.5	82.3
50 to 54 years......	26.3	49.8	67.7	72.5	72.4	73.1	73.8
55 to 59 years......	22.6	46.1	48.5	51.9	51.9	52.4	52.9
60 years and over...	9.8	16.7	33.8	36.2	36.2	36.6	37.0

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Averages for selected countries--col. (1)

United Nations, *Demographic*, 1962, pp. 12, 22. The LFPR's were linearly interpolated for applicability to the same age groupings as the LFPR's for the U.S.S.R. The male rates are averages for 30 countries having 35 to 39 percent of active males engaged in agriculture and related activities. These countries are designated as semi-industrialized. The female rates are averages for 14 countries having less than 35 percent of active males engaged in agriculture and related activities. These countries are designated as industrialized. There are no female rates for semi-industrialized countries in the source.

United States--col. (2)

U.S. Department of Labor, *Employment*, 1965, p. 9.

U.S.S.R., 1959 census--col. (3)

Labor force data are from *Itogi*, pp. 96, 98, 104, 119, 122, and 127. Population data used as the base for computing LFPR's are from Brackett and DePauw, "Population," 1966, pp. 662-674. The LFPR's were computed as follows:

(1) The census volume gives labor force totals, by sex, excluding persons working only in the private sector (p. 104). These totals were distributed among the age groups by means of a percentage distribution of the labor force by age and sex reported on pp. 119, 121.

(2) Persons working only in the private sector are reported by sex, for two broad age groups: The able-bodied ages (males 16-59 years; females 16-54 years) and the older ages (males 60 years and over; females 55 years and over) (pp. 96, 98). Males in the able-bodied ages were arbitrarily distributed equally between the two age groups 50-54 and 55-59. The females were allocated among the relevant age groups according to a percentage distribution reported for females in individual peasant farming (p. 122). This distribution was adjusted to reflect the known allocation of women in the private sector between the able-bodied and non-able-bodied ages (pp. 96, 98).

(3) LFPR's were then computed by adding the totals for each of the age-sex groups derived in steps (1) and (2) and dividing the results by the relevant population figures.

U.S.S.R., variant I, 1965--col. (4)

Estimated by adjusting 1959 census LFPR's [col. (3)] as follows:

Age group
14 and 15: The 1959 LFPR for each sex was held constant.
16 to 19: The 1959 LFPR for each sex was projected to 1965 on the basis of changes in full-time school enrollment (see table 4).
All other: The 1959 female LFPR's were first increased by 2 percent, thus allowing female participation to increase faster than male participation. The LFPR's for both sexes were then adjusted upward proportionately to yield the 1965 total labor force, which was derived independently as described in table A-1. No rate was allowed to exceed 98.0 percent.

U.S.S.R., variant II, 1965, 1970, 1975--cols. (5), (6), and (7)

Age group
14 and 15: The 1959 LFPR for each sex was held constant.
16 to 19: The 1959 LFPR for each sex was projected on the basis of full-time school enrollment (see table 4).
All other:
1965: All 1959 rates were increased by 7 percent except that no rate was allowed to exceed 98 percent.
1970 and 1975: Males--all 1965 rates were held constant. Females--all 1965 LFPR's were increased by 1 percent to 1970; the resultant 1970 LFPR's were increased by 1 percent to 1975.

Table A-4.—Reported and Projected Annual Average Employment in Nonagricultural Sectors, U.S.S.R.: 1950 to 1975

(In thousands)

Line no.	Sector	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1	Total	36,958	41,234	44,023	45,642	47,555	49,710	52,071	54,909	58,023	60,103	62,187	64,706
2	Workers and employees	35,458	39,634	42,223	44,442	46,355	48,410	50,671	[1]54,909	58,023	60,103	62,187	64,706
3	Industry	14,144	16,261	17,367	18,500	19,144	19,675	20,207	22,291	23,475	24,297	25,057	25,933
4	Construction	2,569	2,843	3,190	3,550	4,000	4,421	4,800	5,143	5,270	5,172	5,237	5,370
5	Forestry	444	416	389	390	377	367	352	359	378	389	399	404
6	Transport	4,082	4,770	5,039	5,216	5,355	5,668	5,972	6,279	6,518	6,677	6,841	7,054
7	Communications	542	582	611	624	641	664	691	738	790	832	877	928
8	Trade and public dining	3,325	3,463	3,725	3,826	4,017	4,190	4,389	4,675	5,010	5,253	5,487	5,752
9	Public health	2,051	2,308	2,627	2,736	2,892	3,059	3,245	3,461	3,677	3,818	3,933	4,082
10	Education	3,315	3,647	3,988	4,103	4,250	4,378	4,556	4,803	5,165	5,521	5,835	6,204
11	Science and scientific services	714	860	992	1,094	1,208	1,338	1,474	1,763	2,011	2,213	2,370	2,497
12	Government and administration	1,831	1,726	1,361	1,342	1,294	1,294	1,273	1,245	1,295	1,316	1,308	1,354
13	Housing-communal economy	1,210	1,345	1,400	1,503	1,579	1,632	1,713	1,920	2,030	2,096	2,182	2,282
14	Credit and insurance institutions	264	263	265	266	261	260	260	265	277	283	289	296
15	Other[2]	967	1,150	1,269	1,292	1,337	1,464	1,739	1,967	2,127	2,236	2,372	2,550
16	Members of producers' cooperatives	1,500	1,600	1,800	1,200	1,200	1,300	1,400	(1)	(1)	(1)	(1)	(1)
17	Industry	1,300	1,400	1,600	1,100	1,100	1,100	1,200	(1)	(1)	(1)	(1)	(1)
18	Services	200	200	200	100	100	200	200	(1)	(1)	(1)	(1)	(1)

Line no.	Sector	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
1	Total	67,751	70,211	72,711	75,300	77,981	80,721	83,595	86,571	89,653	92,845	96,150
2	Workers and employees	67,751	70,211	72,711	75,300	77,981	80,721	83,595	86,571	89,653	92,845	96,150
3	Industry	27,056	27,689	28,322	28,969	29,631	30,302	30,995	31,704	32,429	33,170	33,928
4	Construction	5,617	5,783	5,948	6,116	6,286	6,454	6,680	6,858	7,096	7,340	7,591
5	Forestry	402	411	400	417	435	454	473	494	515	537	498
6	Transport	7,252	7,484	7,768	8,015	8,316	8,571	8,889	9,218	9,499	9,846	10,204
7	Communications	1,007	1,063	1,110	1,158	1,209	1,260	1,368	1,427	1,488	1,552	1,618
8	Trade and public dining	6,009	6,293	6,614	6,903	7,204	7,563	7,890	8,230	8,584	9,011	9,396
9	Public health	4,277	4,465	4,661	4,865	5,077	5,294	5,470	5,706	5,951	6,206	6,471
10	Education	6,600	6,931	7,324	7,691	8,074	8,470	8,837	9,273	9,728	10,204	10,702
11	Science and scientific services	2,624	2,806	3,018	3,243	3,481	3,681	3,892	4,170	4,406	4,655	4,916
12	Government and administration	1,460	1,488	1,509	1,529	1,596	1,613	1,631	1,701	1,717	1,790	1,804
13	Housing-communal economy	2,386	2,509	2,619	2,734	2,853	3,025	3,156	3,292	3,433	3,581	3,733
14	Credit and insurance institutions	300	298	311	324	338	353	368	384	343	358	373
15	Other[1]	2,761	2,991	3,107	3,336	3,481	3,681	3,946	4,114	4,464	4,595	4,916

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[1] The system of producers' cooperatives was abolished in October 1960. Employment formerly in this sector is now included in the workers and employees category, by sector as appropriate.

[2] Consists of capital repair of building and structures, drilling, project-survey organizations, literature and publishing, art, and other unidentified.

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Total--line (1)

1950-59: Sum of parts, (1) = (2) + (16).
1960-75: (1) = (2).

Workers and employees--line (2)

1950-65: Sum of parts, (2) = Σ[(3) through (15)].

1966-69, 1971-75: Projected at a rate of increase of 3.56 percent per year, compounded. This is the annual rate computed from the total in 1965 and that projected for 1970.

1970: The difference between 91.5 million workers and employees in 1970 (the average of the plan figures of 91-92 million reported in *Izvestiya*, February 20, 1966, p. 3) and the projected number of workers and employees in agriculture (line 4 of table A-5).

Workers and employees, by branch--lines (3) - (15)

1950, 1958, 1963: *Nar. khoz. v 1964*, pp. 546, 547.
1953: *Nar. khoz. v 1958*, p. 659.
1955: *Nar. khoz. v 1960*, pp. 636, 637.
1956-57: *Nar. khoz. v 1959*, pp. 588, 589.
1959, 1961: *Nar. khoz. v 1962*, pp. 453, 454.
1960, 1964-65: *Nar. khoz. v 1965*, pp. 558, 559.
1962: *Nar. khoz. v 1963*, pp. 475, 476.

1966-75: Line (3), industry was projected to 1970 on the basis of planned increases in output and productivity as reported in *Izvestiya*, February 20, 1966, p. 2. Other years were computed by applying the compounded rate computed for the period 1966-70.

Lines (4) through (15) were projected in three steps:
(a) a total for the nonindustrial sectors was obtained for each year by subtracting (3) from (2);
(b) each of the sectors was projected to 1975 on the basis of its own trend for the period 1958-65;
(c) a percentage distribution of the 12 projected totals for each year was then applied to the nonindustrial total derived in (a) above.

Members of producers' cooperatives--lines (16) - (18)

1950-59: Reported in U.S. Congress, Joint Economic Committee, *Current*, 1965, p. 67.

Table A-5.—Estimates and Projections of Annual Average Employment in Socialized Agriculture, U.S.S.R.: 1950 to 1975

(In thousands)

Line no.	Item	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
	VARIANT A												
1	Total	31,037	29,626	30,957	31,795	31,093	31,095	30,338	29,423	28,538	28,197	27,739	27,752
2	Nonagricultural work	2,834	2,705	2,818	3,327	3,333	2,958	3,056	2,909	2,603	2,568	2,408	2,105
3	Agricultural work	28,203	26,921	28,139	28,468	27,760	28,137	27,282	26,514	25,935	25,629	25,331	25,647
4	Workers and employees	3,437	3,797	4,239	4,273	5,228	5,695	5,838	7,123	7,838	8,197	8,339	8,552
5	State farms and subsidiary state agricultural enterprises	2,425	2,552	2,832	2,925	3,961	4,614	4,957	6,324	7,366	7,730	7,874	8,071
6	Nonagricultural work	225	252	232	225	261	314	357	524	566	630	574	571
7	Agricultural work	2,200	2,300	2,600	2,700	3,700	4,300	4,600	5,800	6,800	7,100	7,300	7,500
8	Other[1]	334	356	260	290	278	362	412	451	469	467	465	481
9	Nonagricultural work	31	35	21	22	18	25	30	37	36	38	34	34
10	Agricultural work	303	321	239	268	260	337	382	414	433	429	431	447
11	MTS's and RTS's[2]	678	889	1,147	1,058	989	719	469	348	3	0	0	0
12	Nonagricultural work	78	118	265	280	254	219	269	148	1	0	0	0
13	Agricultural work	600	771	882	778	735	500	200	200	2	0	0	0
14	Collective farmers	27,600	25,829	26,718	27,522	25,865	25,400	24,500	22,300	20,700	20,000	19,400	19,200
15	Nonagricultural work	2,500	2,300	2,300	2,800	2,800	2,400	2,400	2,200	2,000	1,900	1,800	1,500
16	Agricultural work	25,100	23,529	24,418	24,722	23,065	23,000	22,100	20,100	18,700	18,100	17,600	17,700

Line no.	Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	VARIANT A											
1	Total	28,067	27,841	27,616	27,390	27,165	26,939	26,714	26,488	26,263	26,037	25,811
2	Nonagricultural work	1,934	1,918	1,903	1,887	1,872	1,856	1,841	1,825	1,810	1,794	1,778
3	Agricultural work	26,133	25,923	25,713	25,503	25,293	25,083	24,873	24,663	24,453	24,243	24,033
4	Workers and Employees	9,167	9,489	9,812	10,134	10,457	10,779	11,101	11,423	11,746	12,068	12,390
5	State farms and subsidiary state agricultural enterprises	8,594	8,916	9,239	9,561	9,884	10,206	10,528	10,850	11,173	11,495	11,817
6	Nonagricultural work	594	616	639	661	684	706	728	750	773	795	817
7	Agricultural work	8,000	8,300	8,600	8,900	9,200	9,500	9,800	10,100	10,400	10,700	11,000
8	Other[1]	573	573	573	573	573	573	573	573	573	573	573
9	Nonagricultural work	40	40	40	40	40	40	40	40	40	40	40
10	Agricultural work	533	533	533	533	533	533	533	533	533	533	533
11	MTS's and RTS's[2]	0	0	0	0	0	0	0	0	0	0	0
12	Nonagricultural work	0	0	0	0	0	0	0	0	0	0	0
13	Agricultural work	0	0	0	0	0	0	0	0	0	0	0
14	Collective farmers	18,900	18,352	17,804	17,256	16,708	16,160	15,613	15,065	14,517	13,969	13,421
15	Nonagricultural work	1,300	1,262	1,224	1,186	1,148	1,110	1,073	1,035	997	959	921
16	Agricultural work	17,600	17,090	16,580	16,070	15,560	15,050	14,540	14,030	13,520	13,010	12,500
	VARIANT B											
1	Total		27,674	27,286	26,904	26,527	26,155	25,789	25,428	25,073	24,721	24,376
2	Nonagricultural work		1,907	1,880	1,854	1,828	1,802	1,777	1,752	1,728	1,703	1,680
3	Agricultural work		25,767	25,406	25,050	24,699	24,353	24,012	23,676	23,345	23,018	22,696
4	Workers and employees		9,489	9,812	10,134	10,457	10,779	11,101	11,423	11,746	12,068	12,390
5	State farms and subsidiary state agricultural enterprises	(Same as variant A for 1950-65)	8,916	9,239	9,561	9,884	10,206	10,528	10,850	11,173	11,495	11,817
6	Nonagricultural work		616	639	661	684	706	728	750	773	795	817
7	Agricultural work		8,300	8,600	8,900	9,200	9,500	9,800	10,100	10,400	10,700	11,000
8	Other[1]		573	573	573	573	573	573	573	573	573	573
9	Nonagricultural work		40	40	40	40	40	40	40	40	40	40
10	Agricultural work		533	533	533	533	533	533	533	533	533	533
11	MTS's and RTS's[2]		0	0	0	0	0	0	0	0	0	0
12	Nonagricultural work		0	0	0	0	0	0	0	0	0	0
13	Agricultural work		0	0	0	0	0	0	0	0	0	0
14	Collective farmers		18,185	17,474	16,770	16,070	15,376	14,688	14,005	13,327	12,653	11,986
15	Nonagricultural work		1,251	1,201	1,153	1,104	1,056	1,009	962	915	868	823
16	Agricultural work		16,934	16,273	15,617	14,966	14,320	13,679	13,043	12,412	11,785	11,163

[1] Includes activities supporting agriculture, such as veterinary services.

[2] Machine-Tractor Stations (MRS's) and Repair Technical Stations (RTS's). The MTS's were abolished in 1958 and replaced by RTS's which were also subsequently abolished.

Table A-5.—Estimates and Projections of Annual Average Employment in Socialized Agriculture, U.S.S.R.: 1950 to 1975—Continued

SOURCES AND METHODOLOGY

VARIANT A

In this table, total employment in farm activities is separated into its agricultural and nonagricultural parts. Soviet statistical yearbooks give employment data for all branches of farm activity and, within this total, for agricultural work only. The difference between the two represents employment in administration, subsidiary industrial activities, transportation, construction, children's and cultural-service institutions, and, on collective farms, capital repair of buildings and structures. On state farms and MTS's, employment in capital repair of buildings and structures and housing-communal economy are not included.

Total--line (1)

1950-75: Sum of parts, (1) = (4) + (14).

Nonagricultural work--line (2)

1950-65: Sum of parts, (2) = (6) + (9) + (12) + (15).

1966-75: Projection based on the assumption that the ratio of nonagricultural employment to agricultural employment will remain at the same level as existed in 1965. Symbolically, $(2)_t = (3)_t \times \frac{(2)_{1965}}{(3)_{1965}}$.

Agricultural work--line (3)

1950-65: Sum of parts, (3) = (7) + (10) + (13) + (16).

1966-75: Projection based on a least squares linear regression expressing the trend of the size of agricultural employment during the period 1955-64. ($Y = 438{,}210 - 210X$, where Y is agricultural employment and X is the calendar year.) The average rate of change was applied to successive years. Symbolically, $(3)_t = (3)_{t-1} - 210$.

Workers and employees--line (4)

1950, 1960, 1963: *Nar. khoz. v 1964*, p. 546.
1953: *Nar. khoz. v 1958*, p. 659.
1955: *Nar. khoz. v 1960*, p. 636.
1956-57: *Nar. khoz. v 1959*, p. 588.
1958, 1964, 1965: *Nar. khoz. v 1965*, p. 558.

For purposes of consistency with pre-1953 and post 1958 data, the figures for 1953-58 were adjusted to remove collective farmers transferred to the employment rolls of machine-tractor stations from collective farms following the October 1953 resolutions of the Communist Party and the U.S.S.R. Government. These employment adjustments totalled 229,000 for 1953, 1,918,000 for 1955, 1,822,000 for 1956, 1,565,000 for 1957, and 500,000 for 1958. See Weitzman and Elias, *Magnitude*, 1961, p. 134.

1959, 1961: *Nar. khoz. v 1962*, p. 453.
1962: *Nar. khoz. v 1963*, p. 475.
1966-75: Sum of parts, (4) = (5) + (8).

State farms and subsidiary state agricultural enterprises--line (5)

1950, 1960, 1963: *Nar. khoz. v 1964*, p. 546.
1953, 1956-57: *Sel'. khoz.*, p. 451.
1955: *Nar. khoz. v 1960*, p. 636.
1958, 1964-65: *Nar. khoz. v 1965*, p. 558.
1959, 1961: *Nar. khoz. v 1962*, p. 453.
1962: *Nar. khoz. v 1963*, p. 475.
1966-75: Projection based on the assumption that the ratio of its agricultural component in 1965 will remain constant. Symbolically, $(5)_t = (7)_t \times \frac{(5)_{1965}}{(7)_{1965}}$.

Nonagricultural work--line (6)

1950-75: (6) = (5) - (7).

Agricultural work--line (7)

1950, 1960, 1962: *Nar. khoz. v 1964*, p. 419.
1953, 1959, 1961: *Nar. khoz. v 1962*, p. 368.
1955: *Nar. khoz. v 1960*, p. 521.
1956-58: *Sel'. khoz.*, p. 450.
1965: *Nar. khoz. v 1965*, p. 435.
1966-75: Projection based on the assumption that the annual increase for state farms will be 300,000.

Other--line (8)

1950-65: Residual, (8) = (4) - (5) - (11).
1966-75: Projection based on the assumption that the 1965 level of employment will remain constant.

Nonagricultural work--line (9)

1950-65: Estimates based on the assumption that the nonagricultural proportion was the same as for state farms in the same year. Symbolically, $(9) = (8) \times \frac{(6)}{(5)}$.

1966-75: Projection based on the assumption that the 1965 level of employment will remain constant.

Agricultural work--line (10)

1950-75: (10) = (8) - (9).

MTS's and RTS's--line (11)

1950: *Nar. khoz. v 1958*, p. 659.
1953, 1956-57: *Sel'. khoz.*, p. 458.
1955, 1958: *Nar. khoz. v 1960*, p. 636.

Data for 1953-58 were adjusted in accordance with the note for workers and employees--line (4).

1959-61: *Nar. khoz. v 1961*, p. 567.

Nonagricultural work--line (12)

1950-61: (12) = (11) - (13).

Agricultural work--line (13)

1950, 1960: *Nar. khoz. v 1963*, p. 363.
1953, 1955, 1958-59: *Nar. khoz. v 1960*, p. 521.
1956-57: *Sel'. khoz.*, p. 450.

Data for 1953-58 were adjusted in accordance with the note for workers and employees--line (4).

1961: Data on total employment were divided between agricultural and nonagricultural work as they were in 1960.

Collective farmers--line (14)

This category includes employment on nonagricultural collective farms.
1950, 1960, 1962-64: *Nar. khoz. v 1964*, p. 419
1953, 1959, 1961: *Nar. khoz. v 1962*, p. 368.
1955: *Nar. khoz. v 1960*, p. 521.
1956-58: *Sel'. khoz.*, p. 450.

Data for 1953-58 were adjusted in accordance with the note for workers and employees--line (4).

1965: *Nar. khoz. v 1965*, p. 435.
1966-75: Sum of parts, (14) = (15) + (16).

Nonagricultural work--line (15)

1950-65: (15) = (14) - (16).
1966-75: (15) = (2) - (6) - (9).

Agricultural work--line (16)

1950, 1960, 1962-64: *Nar. khoz. v 1964*, p. 419.
1953, 1959, 1961: *Nar. khoz. v 1962*, p. 368.
1955, 1958: *Nar. khoz. v 1960*, p. 521.
1956-57: *Sel'. khoz.*, p. 450.

Data for 1953-58 were adjusted in accordance with the note for workers and employees--line (4).

1965: *Nar. khoz. v 1965*, p. 435.
1966-75: (16) = (3) - (7) - (10).

VARIANT B

The methodology for variant B was the same as for variant A with the following exception:

Agricultural work--line (3)

1966-75: Projection based on planned increases in output and productivity, as reported in *Izvestiya*, February 20, 1966, p. 2. The planned increase in output is calculated as 5.5 percent per year and the planned increase in productivity as 7.0 percent per year. Symbolically,

$$(3)_t = (3)_{t-1} \times \frac{105.5}{107.0}.$$

Table A-6.—Estimates and Projections of Man-Year Equivalent Employment in the Private Sector of Agriculture, U.S.S.R.: 1950 to 1975

(In thousands)

Year	Variant A	Variant B	Nimitz
1950	11,899	11,899	16,000
1953	10,864	10,864	15,200
1955	12,238	12,238	15,200
1956	12,505	12,505	13,900
1957	12,471	12,471	14,300
1958	12,616	12,616	14,700
1959	11,503	11,503	14,300
1960	10,896	10,896	16,100
1961	11,273	11,273	18,500
1962	11,297	11,297	18,400
1963	10,867	10,867	17,800
1964	10,906	10,906	(NA)
1965	12,034	12,034	(NA)
1966	11,938	11,867	(NA)
1967	11,842	11,700	(NA)
1968	11,745	11,536	(NA)
1969	11,648	11,375	(NA)
1970	11,551	11,215	(NA)
1971	11,455	11,058	(NA)
1972	11,358	10,904	(NA)
1973	11,262	10,751	(NA)
1974	11,165	10,600	(NA)
1975	11,068	10,452	(NA)

NA Not available.

SOURCES AND METHODOLOGY

Variant A

1950-64: Feshbach, "Manpower," 1966, pp. 746-747. The estimates were made on the basis of the labor input requirements to cultivate and care for the agricultural holdings in private ownership. Labor input coefficients for 1958, from Gol'tsov, "Utilization," 1961, pp. 46-47, were held constant. The estimates include employment of individual peasants.

1965: Ibid.; Nar. khoz. v 1965, pp. 288, 368-369.

1966-75: Projection based on the assumption that such employment would constitute a constant (1965) proportion of the variant A projection of socialized agricultural employment (see table A-5).

Variant B

1950-65: Same as variant A.

1966-75: Projection based on the assumption that such employment would constitute a constant (1965) proportion of the variant B projection of socialized agricultural employment (see table A-5).

Nimitz

1950-63: Nimitz, Farm, 1965, p. 7. These estimates were also made on the basis of labor input requirements to cultivate and care for agricultural holdings in private ownership. The input coefficients were derived for several "base years" on the basis of various Soviet sources and for interim years by interpolation.

Table A-7.—Estimates and Projections of Annual Average Civilian Employment in the U.S.S.R., by Sector and Class of Worker: 1950 to 1975

(In thousands)

Sector and class of worker	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
VARIANT A												
Total	79,894	81,724	87,218	89,942	91,119	93,421	93,912	95,228	97,834	99,597	100,793	103,364
Nonagricultural sectors	36,958	41,234	44,023	45,642	47,555	49,710	52,071	54,909	58,023	60,103	62,187	64,706
Agricultural sectors	42,936	40,490	43,195	44,300	43,564	43,711	41,841	40,319	39,811	39,494	38,606	38,658
Workers and employees	3,437	3,797	4,239	4,273	5,228	5,695	5,838	7,123	7,838	8,197	8,339	8,552
Collective farmers	27,600	25,829	26,718	27,522	25,865	25,400	24,500	22,300	20,700	20,000	19,400	19,200
Private sector	11,899	10,864	12,238	12,505	12,471	12,616	11,503	10,896	11,273	11,297	10,867	10,906
Class of Worker												
Workers and employees	40,395	45,031	48,262	49,915	52,783	55,405	57,909	62,032	65,861	68,278	70,526	73,258
Collective farmers	27,600	25,829	26,718	27,522	25,865	25,400	24,500	22,300	20,700	20,000	19,400	19,200
Private sector	11,899	10,864	12,238	12,505	12,471	12,616	11,503	10,896	11,273	11,297	10,867	10,906

Sector and class of worker	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
VARIANT A											
Total	107,852	109,990	112,169	114,435	116,794	119,211	121,764	124,417	127,178	130,047	133,029
Nonagricultural sectors	67,751	70,211	72,711	75,300	77,981	80,721	83,595	86,571	89,653	92,845	96,150
Agricultural sectors	40,101	39,779	39,458	39,135	38,813	38,490	38,169	37,846	37,525	37,202	36,879
Workers and employees	9,167	9,489	9,812	10,134	10,457	10,779	11,101	11,423	11,746	12,068	12,390
Collective farmers	18,900	18,352	17,804	17,256	16,708	16,160	15,613	15,065	14,517	13,969	13,421
Private sector	12,034	11,938	11,842	11,745	11,648	11,551	11,455	11,358	11,262	11,165	11,068
Class of Worker											
Workers and employees	76,918	79,700	82,523	85,434	88,438	91,500	94,696	97,994	101,399	104,913	108,540
Collective farmers	18,900	18,352	17,804	17,256	16,708	16,160	15,613	15,065	14,517	13,969	13,421
Private Sector	12,034	11,938	11,842	11,745	11,648	11,551	11,455	11,358	11,262	11,165	11,068
VARIANT B											
Total	(Same as variant A for 1950-65)	109,752	111,697	113,740	115,883	118,091	120,442	122,903	125,477	128,166	130,978
Nonagricultural sectors		70,211	72,711	75,300	77,981	80,721	83,595	86,571	89,653	92,845	96,150
Agricultural sectors		39,541	38,986	38,440	37,902	37,370	36,847	36,332	35,824	35,321	34,828
Workers and employees		9,489	9,812	10,134	10,457	10,779	11,101	11,423	11,746	12,068	12,390
Collective farmers		18,185	17,474	16,770	16,070	15,376	14,688	14,005	13,327	12,653	11,986
Private sector		11,867	11,700	11,536	11,375	11,215	11,058	10,904	10,751	10,600	10,452
Class of Worker											
Workers and employees		79,700	82,523	85,434	88,438	91,500	94,696	97,994	101,399	104,913	108,540
Collective farmers		18,185	17,474	16,770	16,070	15,376	14,688	14,005	13,327	12,653	11,986
Private sector		11,867	11,700	11,536	11,375	11,215	11,058	10,904	10,751	10,600	10,452

Source: Tables A-4, A-5, and A-6.

Table A-8.—Estimates of Man-Day Employment in the U.S.S.R., by Sector: 1950 to 1965

Table A-8.—Estimates of Man-Day Employment in the U.S.S.R., by Sector: 1950 to 1965

(In millions)

Line no.	Sector	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	Total	21,793	21,793	23,485	23,861	23,854	24,367	24,692	25,141	25,698	26,147	26,539	27,382	28,611
2	Nonagricultural sectors	10,212	11,333	12,031	12,420	12,716	13,323	13,877	[1]14,655	15,329	15,832	16,448	17,244	18,055
3	Industry	3,908	4,469	4,746	5,034	5,119	5,273	5,385	5,949	6,202	6,400	6,628	6,911	7,210
4	Construction	710	781	872	966	1,070	1,185	1,279	1,373	1,392	1,362	1,385	1,431	1,497
5	Transport and communications	1,278	1,471	1,544	1,589	1,603	1,697	1,776	1,873	1,931	1,978	2,041	2,127	2,201
6	Trade and public dining	919	952	1,018	1,041	1,074	1,123	1,170	1,248	1,324	1,384	1,451	1,533	1,601
7	Public health and education	1,680	1,873	2,079	2,159	2,233	2,352	2,472	2,676	2,867	3,043	3,211	3,407	3,598
8	Other[2]	1,303	1,347	1,280	1,304	1,296	1,345	1,422	1,536	1,613	1,665	1,732	1,835	1,948
9	Producers' cooperatives	414	440	492	327	321	348	373	(1)	(1)	(1)	(1)	(1)	(1)
10	Agricultural sectors	11,581	10,460	11,454	11,441	11,138	11,044	10,815	10,486	10,369	10,315	10,091	10,138	10,556
11	Workers and employees	963	1,064	1,187	1,197	1,464	1,594	1,665	1,994	2,204	2,312	2,353	2,438	2,612
12	State farms[3]	679	715	793	819	1,109	1,292	1,413	1,771	2,070	2,180	2,221	2,301	2,449
13	Nonagricultural work	63	71	65	63	73	88	102	147	159	178	162	163	169
14	Agricultural work	616	644	728	756	1,036	1,204	1,311	1,624	1,911	2,002	2,059	2,138	2,280
15	Other[4]	94	86	73	61	58	101	118	126	133	132	132	137	163
16	Nonagricultural work	9	8	6	5	4	7	9	10	10	11	10	10	11
17	Agricultural work	85	78	67	56	54	94	109	116	123	121	122	127	152
18	MTS's and RTS's[5]	190	263	321	317	297	201	134	97	1	(X)	(X)	(X)	(X)
19	Nonagricultural work	22	47	74	99	91	61	77	41	(X)	(X)	(X)	(X)	(X)
20	Agricultural work	168	216	247	218	206	140	57	56	1	(X)	(X)	(X)	(X)
21	Collective farmers	7,286	6,354	6,840	6,743	6,182	5,918	5,929	5,441	5,009	4,840	4,695	4,646	4,574
22	Nonagricultural work	660	566	589	686	669	559	581	537	484	460	436	363	315
23	Agricultural work	6,626	5,788	6,251	6,057	5,513	5,359	5,348	4,904	4,525	4,380	4,259	4,283	4,259
24	Agricultural artels	7,197	6,257	6,708	6,619	6,031	5,835	5,827	5,311	4,915	4,787	4,645	4,597	4,525
25	Nonagricultural artels	89	97	132	124	151	83	102	130	94	53	50	49	49
26	Private sector	3,332	3,042	3,427	3,501	3,492	3,532	3,221	3,051	3,156	3,163	3,043	3,054	3,370

X Not applicable.

[1] The system of producers' cooperatives was abolished in October 1960. Employment formerly in this sector is now included in the workers and employees category, by sector as appropriate.

[2] Consists of the housing-communal economy, government and administration, credit and insurance institutions, forestry, and an undistributed residual.

[3] Includes subsidiary state agricultural enterprises.

[4] Includes activities supporting agriculture, such as veterinary services.

[5] Machine-Tractor Stations (MTS's) and Repair Technical Stations (RTS's). The MTS's were abolished in 1958 and replaced by RTS's which were also subsequently abolished.

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Total--line (1): Sum of parts, (1) = (2) + (10).

Nonagricultural sectors

Line (2): Sum of parts, (2) = Σ[(3) through (9)].

Lines (3) through (9): Computed by multiplying the annual average employment for each sector (table A-4) in each year by the average number of man-days per annual average industrial wageworker in the same year (table A-10).

Agricultural sectors--line (10): Sum of parts, (10) = (11) + (21) + (26).

Table A-8.—Estimates of Man-Day Employment in the U.S.S.R., by Sector: 1950 to 1965—Continued

Workers and employees--line (11): Sum of parts, (11) = (12) + (15) + (18).

State farms and subsidiary state agricultural enterprises--line (12): Sum of parts, (12) = (13) + (14).

Nonagricultural work--line (13): Computed by multiplying annual average employment in nonagricultural activities on state farms (table A-5) by the following estimated or reported man-days per annual average worker: 1950-58, 280; 1959, 285; 1960, 280; 1961, 281; 1962-63, 282; 1964-65, 285. The figures for 1950-58, 1963, and 1965 are estimated, the others are reported (table A-10).

Agricultural work--line (14): Computed in the same manner and using the same numbers of man-days per annual average worker as line (13).

Other--line (15): Sum of parts, (15) = (16) + (17).

Nonagricultural work--line (16); Agricultural work--line (17): Computed in the same manner and using the same numbers of man-days per annual average worker as line (13).

MTS's and RTS's--line (18): Sum of parts, (18) = (19) + (20).

Nonagricultural work--line (19); Agricultural work--line (20): Computed in the same manner and using the same number of man-days per annual average worker as line (13).

Collective farmers--line (21): Computed by multiplying annual average employment on collectives (table A-5) by the number of man-days worked per annual average collective farmer (table A-11). The average number of man-days for 1963, 1964, and 1965 was assumed to be 242.

Nonagricultural work--line (22): (22) = (21) - (23).

Agricultural work--line (23): Computed in the same manner and using the same average number of man-days as line (21), but using annual average employment in agricultural work on collective farms (table A-5).

Agricultural artels--line (24)

1950-62: Nimitz, *Farm*, 1965, p. 7.
1963-65: Computed by moving the 1962 man-day figure by an index of annual average employment in agricultural artels (table A-5).

Nonagricultural artels--line (25): (25) = (21) - (24).

Private sector--line (26): Computed by multiplying the man-year equivalent employment figures from table A-6 by 280 man-days per man-year equivalent.

Table A-9.—Estimates and Projections of Man-Hour Employment in the U.S.S.R., by Sector: 1950 to 1975

Table A-9.—Estimates and Projections of Man-Hour Employment in the U.S.S.R., by Sector: 1950 to 1975

(In millions)

Line no.	Sector and class of worker	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
	VARIANT A												
1	Total	174,344	174,344	187,880	185,175	184,220	185,477	186,018	180,171	181,460	184,224	186,438	191,959
2	Nonagricultural sectors[1]	81,696	90,664	96,248	93,647	95,116	97,125	99,498	96,283	100,712	104,016	108,063	113,293
3	Industry[2]	31,264	35,752	37,968	38,510	38,853	39,020	39,311	39,680	41,367	42,688	44,209	46,096
4	Agricultural sectors	92,648	83,680	91,632	91,528	89,104	88,352	86,520	83,888	80,748	80,208	78,375	78,666
5	Workers and employees	7,704	8,512	9,496	9,576	11,712	12,752	13,320	15,952	15,428	16,184	16,471	17,066
6	Collective farmers	58,288	50,832	54,720	53,944	49,456	47,344	47,432	43,528	40,072	38,720	37,560	37,168
7	Private sector	26,656	24,336	27,416	28,008	27,936	28,256	25,768	24,408	25,248	25,304	24,344	24,432

Line no.	Sector and class of worker	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
	VARIANT A											
1	Total	200,457	204,140	207,887	211,784	215,846	220,006	224,407	228,983	233,747	238,702	243,852
2	Nonagricultural sectors	118,621	122,939	127,317	131,850	136,545	141,342	146,375	151,586	156,982	162,572	168,359
3	Industry	48,091	49,203	50,328	51,478	52,654	53,847	55,078	56,338	57,626	58,943	60,290
4	Agricultural sectors	81,836	81,201	80,570	79,934	79,301	78,664	78,032	77,397	76,765	76,130	75,493
5	Workers and employees	18,284	18,931	19,575	20,217	20,862	21,504	22,146	22,789	23,433	24,076	24,718
6	Collective farmers	36,592	35,529	34,469	33,408	32,347	31,286	30,227	29,166	28,105	27,044	25,983
7	Private sector	26,960	26,741	26,526	26,309	26,092	25,874	25,659	25,442	25,227	25,010	24,792
	VARIANT B											
1	Total	(Same as variant A for 1950-65)	203,658	206,930	210,375	213,999	217,736	221,727	225,914	230,298	234,888	239,694
2	Nonagricultural sectors		122,939	127,317	131,850	136,545	141,342	146,375	151,586	156,982	162,572	168,359
3	Industry		49,203	50,328	51,478	52,654	53,847	55,078	56,338	57,626	58,943	60,290
4	Agricultural sectors		80,719	79,613	78,525	77,454	76,394	75,352	74,328	73,316	72,316	71,335
5	Workers and employees		18,931	19,575	20,217	20,862	21,504	22,146	22,789	23,433	24,076	24,718
6	Collective farmers		35,206	33,830	32,467	31,112	29,768	28,436	27,114	25,801	24,496	23,205
7	Private sector		26,582	26,208	25,841	25,480	25,122	24,770	24,425	24,082	23,744	23,412

[1] Includes employment in producers' cooperatives for the years 1950-59 (see table A-4).

[2] Beginning in 1960 this category includes employment previously enumerated in the category of industrial producers' cooperatives (see table A-4).

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VARIANT A

Total--line (1)

1950-75: Sum of parts, (1) = (2) + (4).

Nonagricultural sectors--line (2)

1950-65: Computed by multiplying total man-days worked in these sectors (table A-8) by the number of man-hours worked per day by workers and employees. Man-hours per day were estimated as follows: 1960-65, the average workweek for all workers and employees (39.4 hours, table A-10) was divided by 6 to yield 6.57 man-hours per man-day; 1956-59, the figure for 1960 (6.57) was moved by an index of the scheduled length of the workday for adult industrial wageworkers (table A-10); and 1950-55, the scheduled length of the workday for adult industrial wageworkers (8 hours) was assumed to apply to all nonagricultural employment.

1966-75: Projection based on the assumption that the number of man-hours per annual average person (table A-4) will remain constant at the 1965 level of 1,751 man-hours (man-hour employment in 1965 divided by annual average employment in 1965).

Table A-9.—Estimates and Projections of Man-Hour Employment in the U.S.S.R., by Sector: 1950 to 1975—Continued

Industry--line (3)

1950-55: Computed in the same manner and using the same numbers of man-hours per man-day as indicated for line (2).
1956-57: Computed in the same manner as line (2), but using different numbers of man-hours per man-day. The latter were estimated by moving the scheduled numbers of hours per man-day for industrial workers (including shortened working day before holidays) in 1958 (table A-10, line 3) by the scheduled number of hours per day worked per adult industrial wageworker (table A-10, line 2).
1958-65: Computed in the same manner as line (2), but substituting the scheduled number of hours per day worked by an industrial wageworker (including shortened working day before holidays).
1966-75: Projection based on the assumption that the number of man-hours per annual average person (table A-4) will remain constant at the 1965 level of 1,777 man-hours.

Agricultural sectors--line (4)

1950-75: Sum of parts, (4) = (5) + (6) + (7).

Workers and employees--line (5)

1950-65: Computed by multiplying man-day employment (table A-8) by the length of the "standard" workday, which was 8 hours until the third quarter of 1960 and 7 hours thereafter (table A-10).
1966-75: Projection based on the assumption that the number of man-hours per annual average person will remain constant at the 1965 level of 1,995 man-hours.

Collective farmers--line (6)

1950-65: Computed by multiplying man-day employment (table A-8) by the average length of the workday, which was assumed to be 8 hours in all years.
1966-75: Projection based on the assumption that the number of man-hours per annual average person will remain constant at the 1965 level of 1,936 man-hours.

Private sector--line (7)

1950-65: Computed in the same manner and using the same number of man-hours per man-day as indicated for line (6).
1966-75: Projection based on the assumption that the number of man-hours per man-year equivalent will remain constant at the 1965 level of 2,240 man-hours.

VARIANT B

Derived in the same manner as variant A, except for the substitution of variant B of annual average employment (table A-7).

Table A-10.—Time Worked by Industrial and State Farm Workers and Employees in the U.S.S.R.—Selected Measures: 1950 to 1965

Line no.	Measure	1950	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	INDUSTRY												
1	Average number of days worked by wageworkers	276.3	273.3	272.1	267.4	268.0	266.5	266.9	264.2	263.4	264.5	266.5	266.4
2	Average scheduled number of hours per day per adult wageworker	8.00	8.00	7.96	7.90	7.70	7.56	6.94	6.93	6.93	6.93	6.93	6.93
3	Including shortened working day before holidays	(NA)	(NA)	(NA)	(NA)	7.40	7.30	6.67	6.67	6.67	6.67	6.67	6.67
4	Average length of scheduled workweek for wageworkers (hours)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	40.0	40.0	40.0	40.0	40.0	40.0
	STATE FARMS												
5	Average number of days worked by all personnel	(NA)	(NA)	(NA)	(NA)	(NA)	285	280	281	282	(NA)	285	(NA)
6	Average scheduled number of hours per day per worker	8	8	8	8	8	8	8	7	7	7	7	(NA)

NA Not available.

SOURCES AND METHODOLOGY

Average number of days worked by wageworker--line (1)

1950, 1958, 1960, 1963, 1964: Nar. khoz. v 1964, p. 138.
1955, 1962: Promyshlennost' SSSR, 1964, p. 87.
1956, 1957: Shishkin, Trudovyye, 1961, p. 69.
1959, 1961: Nar. khoz. v 1962, p. 131.
1965: Nar. khoz. v 1965, p. 142.

Average scheduled number of hours per day per adult wageworker--line (2)

1950, 1955, 1957: U.S. Congress, Joint Economic Committee, Current, 1965, p. 80.
1956, 1964: Nar. khoz. v 1964, p. 665.
1958: Nar. khoz. v 1958, p. 665.
1959: Nar. khoz. v 1959, p. 596.
1960: Nar. khoz. v 1960, p. 645.
1961: Nar. khoz. v 1961, p. 602.
1962: Nar. khoz. v 1962, p. 488.
1963: Nar. khoz. v 1963, p. 506.
1965: Nar. khoz. v 1965, p. 593.

Including shortened working day before holidays--line (3)

1958-65: Same sources as for line (2).

Average length of scheduled workweek for wageworker--line (4)

1960-65: Same sources as for line (2). The comparable figure for all workers and employees in all years, 1960-65, is 39.4 hours.

Average number of days worked by all personnel--line (5)

1959-62: Khlebnikov, "Labor," 1963, p. 68.
1964: Sinyukov, Ekonomika, 1966, p. 244.

Average scheduled number of hours per day per worker--line (6)

1950-65: Nimitz, Farm, 1965, p. 140. The change from an 8- to a 7-hour day occurred in the last quarter of 1960.

Table A-11.—Manpower and Its Utilization on Agricultural Collective Farms in the U.S.S.R.: 1950 to 1965

Line no.	Item	1950	1953	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	Collective farm members participating in socialized production (millions)	40.7	38.2	39.5	40.2	(NA)	36.8	35.6	32.3	30.4	29.6	(NA)	(NA)	(NA)
2	Of these, able-bodied (millions)	28.1	26.2	27.8	(NA)	(NA)	26.8	26.1	23.6	21.9	21.2	20.6	(NA)	(NA)
3	Households (end of year)(millions)	20.5	19.7	19.8	19.9	18.9	18.8	18.5	17.1	16.4	16.3	16.1	15.9	15.4
4	Participants per household	1.99	1.94	1.99	2.02	(NA)	1.96	1.92	1.89	1.85	1.82	(NA)	(NA)	(NA)
5	Of these, able-bodied	1.37	1.33	1.40	(NA)	(NA)	1.43	1.41	1.38	1.34	1.30	1.28	(NA)	(NA)
6	Man-days worked (millions)	7,197	6,257	6,708	6,619	6,031	5,835	5,827	5,311	4,915	4,787	(NA)	(NA)	(NA)
7	Annual average employment (thousands)	27,305	25,458	26,198	26,980	25,280	25,075	24,101	21,733	20,323	19,784	19,198	19,001	18,600
8	Man-days worked per annual average collective farmer	264	246	256	245	239	233	242	244	242	242	(NA)	(NA)	(NA)
9	Man-days worked per participant	177	164	170	165	(NA)	159	164	164	162	162	(NA)	(NA)	(NA)
10	Man-days worked per able-bodied participant	(NA)	209	220	205	214	214	205	197	198	199	(NA)	196	(NA)
11	Participants per annual average collective farmer	1.49	1.50	1.51	1.49	(NA)	1.47	1.48	1.49	1.50	1.50	(NA)	(NA)	(NA)
12	Lowest month participation as a percentage of highest month	(NA)	56	56	56	57	58	59	59	58	58	59	(NA)	(NA)

NA Not available.

SOURCES AND METHODOLOGY

Collective farm members participating in socialized production--line (1)

1950, 1955: Computed from indexes in Karnaukhova, "Methods," 1959, p. 35.
1953, 1958-62: Karnaukhova, "Utilization," 1964, p. 56.
1956: Vasilenko, "Labor," 1962, p. 191. Vasilenko states that the number of participants in 1953 was equal to 2.5 million less than in 1950, the number in 1956 was equal to 2 million more than in 1953, and the number in 1959 was equal to 4.6 million less than in 1956. These relationships are consistent with the other figures in this row which are derived from Karnaukhova. Man-day figures for 1956, 1958, and 1959 are also reported in Shishkin, Trudovyye, 1961, p. 99. They are lower than Karnaukhova's, and clearly are not of the same series. Presumably Karnaukhova's figures represent the same series through time, and her figures were used rather than Shishkin's for the years in question.

Able-bodied--line (2)

1950, 1955: Karnaukhova, "Methods," 1959, p. 35.
1953, 1958-62: Karnaukhova, "Utilization," 1964, p. 56.
1963: Calculated from Venzher, Ispol'zovaniye, 1965, p. 111; and Nar. khoz. v 1963, p. 226. Venzher gives the average number of able-bodied farmers per farm which was multiplied by the number of farms to yield the number of able-bodied participants.

Households--line (3)

1950-56: Nar. khoz. v 1956, p. 140.
1957: Nar. khoz. v 1958, p. 494.
1958, 1963: Nar. khoz. v 1963, p. 341.
1959, 1960-62: Nar. khoz. v 1962, p. 330.
1964: Nar. khoz. v 1964, p. 390.
1965: Tsifrakh v 1965, p. 90.

Participants per household--line (4)

1950-62: (4) = (1) ÷ (3).

Able-bodied participants per houshold--(5)

1950-63: (5) = (2) ÷ (3).

Man-days worked--line (6)

1950-63: Nimitz, Farm, 1965, p. 7. For the years 1950-57, Nimitz converts labor-days to man-days, and from the years 1958-62, uses data of Karnaukhova ("Utilization") and Khlebnikov ("Labor"), which refer to the same series. She adjusted the series to reflect the otherwise unrecorded labor input of hired (nayemnyye) and attached (privlechenyye) workers.

Annual average employment--line (7)

1950, 1958, 1960, 1962-64: Nar. khoz. v 1964, p. 420.
1953, 1959, 1961: Nar. khoz. v 1962, p. 368.
1955: Nar. khoz. v 1960, p. 522.
1956, 1957: Sel'. khoz., p. 459.
1965: Nar. khoz. v 1965, p. 436.
1953-58: Adjusted for MTS transfers (see table A-5).

Man-days worked per annual average collective farmer--line (8)

1950-62: (8) = (6) ÷ (7). A very slight exaggeration is involved due to the adjustment described in line (6).

Man-days worked per participant--line (9)

1950-62: (9) = (6) ÷ (1). See note to line (8).

Man-days worked per able-bodied participant--line (10)

1953-64: Feshbach, "Manpower," 1966, p. 785.

Participants per annual average collective farmer--line (11)

1950-62: (11) = (1) ÷ (7).

Lowest month participation as a percentage of highest month--line (12)

1953-63: Computed from Feshbach, "Manpower," 1966, p. 759. Except for 1955, this figure is equal to the number of participants in January as a percent of the number of participants in July (August in 1955).

Appendix

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